August 30, 1956

The IRON AGE

Special Survey Report

How to Hit Your Market P.53

Short-Term Business Loans Get Tighter P.43

Ultrasonics Improves Quenching Practice P.83

Digest of the Week P–2

THE OTHER TURN

EVERY TIME I SEE BALDY HE'S TAKIN' ANOTHER PULL AT THAT TAP. HE MUST 'A BEEN BORN THIRSTY.
HE AIN'T THIRSTY. HE JUST USES WATER TO FLOAT DOWN THEM SALT TABLETS.
YEH, EVER SINCE STASH TOLD 'IM THEY'RE MADE OUT'A ASBESTOS HE THINKS HE'S INSULATIN' HISSELF.
SALT TABLETS
THANKS TO C.A. GREENLEE
KUEKES

The Camel

WHY NOT DESCRIBE YOUR OPEN-HEARTH CARTOON IDEA AND SEND IT ALONG TO US?

The benefits steelmakers obtain from our refractories are in part a result of Basic's on-the-job servicing. One of the rewards of this close relationship has been the opportunity to observe and appreciate the lighter side of these usually serious craftsmen.

BASIC INCORPORATED 845 HANNA BUILDING • CLEVELAND 15 OHIO

Now the kitchen is as big as all outdoors

This is the season when America moves the dining-room outside — and takes the kitchen right along with it! Today practically anyone can enjoy an "outdoor kitchen," thanks to ingenious, efficient, low-cost barbecue grills such as this one.

Like so many others, this model is all-steel, with the bowl, legs, handle and wheels being formed from cold-rolled sheet. Bethlehem supplies sheets to some leading manufacturers of barbecue grills and the tonnage, needless to say, is fairly zooming.

The same is true of many other products that have hit the "big time" just since World War II. Room air-conditioners, for example, and hay-balers, TV cabinets, steel ironing boards.

At the same time the demands of older users are increasing, too. Which should make it easier to understand why Bethlehem is being called upon to turn out hot- and cold-rolled sheets in larger volume than ever before. We are doing everything we can to catch up with this ever-mounting demand.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor*: Bethlehem Steel Export Corporation

BETHLEHEM SHEETS

BETHLEHEM STEEL

DIGEST OF THE WEEK IN METALWORKING

Aug. 30, 1956—Vol. 178, No. 9

The IRON AGE

Digest of the Week in Metalworking

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NEWS DEVELOPMENTS

WHY SHORT TERM LOANS ARE HARD TO GET P. 43

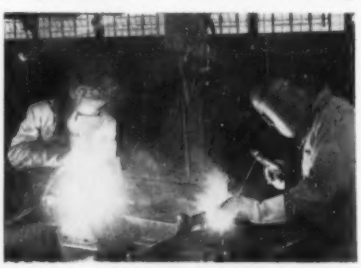
Capital borrowing has overflowed into financial sources normally available for seasonal borrowing. Short term borrowing for third quarter is above usual rate. No easy solution for tight money troubles.

STEEL TOWERS: MICROWAVES TO THE RESCUE P. 45

With video transmission markets just about exhausted, tower manufacturers are relieved to find another ready buyer for their wares. Use of microwaves for telegraph and voice signals shows great future promise.

WELDING SALES ARC SWINGS UPWARD P. 48

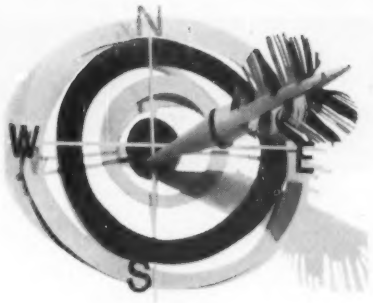
Welding equipment sales are running 10 pct ahead of 1955. Contributing



factors are continued technological improvements, increased use of weldments in construction industry, and growing stainless steel market.

FOURTH QUARTER AUTO SALES RECORD POSSIBLE? P. 64

Sudden sales spurt after nine months of sluggishness revives optimism in Detroit. American Motors and Chrysler register substantial gains. Truck production is unseasonably high, but handicapped by parts shortage.



UNEASY lies the head of the business man who's not sure he's hitting his market target. But there are tools available to help him. This Iron Age Survey Report To Management not only pinpoints these tools but tells how to get the most from them. P. 53.

WILL U. S. SHIFT FOREIGN AID EMPHASIS? P. 69

The Soviet success with economic promises is prompting study. As a result Senate may re-evaluate military aid in favor of economic gifts. Military assistance programs may be tapered off in the future. Prospect is government may cut back on military hardware for shipment to U. S. allies and stepup its procurements of civilian-type equipment during the year to come.

FEATURE ARTICLES

ULTRASONIC QUENCHING: NEW, MORE EFFECTIVE P. 83

Definitely different, remarkably efficient—ultrasonic quenching actually provides hardnesses that are higher. No amount of quench oil agitation can produce the same quenching effectiveness. Reason: Ultrasonics sends vibratory waves through the quenching medium. They instantly break down the vapor phase surrounding the hot part, guarantee more efficient cooling.

NEW ETCH SPOTS LEADED STEELS P. 86

With ever-widening use of leaded steel, need for a satisfactory etching technique for spotting lead-bearing constituents has grown by leaps and bounds. Here's the answer. This etching technique, using relatively simple reagents, lends a consistent identifying color to leaded micro-constituents.

CONTROLLING WELD DISTORTION WITHIN CLOSE LIMITS P. 88

Always a problem, weld distortion can be predicted and controlled within close limits. It calls, however, for an understanding of the forces causing distortion. Also it focuses attention on residual stresses, and how to first predict, then influence them.

TURRET LATHE ATTACHMENT CUTS COMPLEX CONTOURS P. 91

Engineered for heavy-duty, saddle-type turret lathes, this contouring tool mounts on any face of many lathe hexagonal turrets. Builder claims attachment plus simple, inexpensive tooling can machine contours involving curves, tapers, radii and even square shoulders. It fits both small and large lot production.

RUBBER-BONDED ABRASIVES GIVE FINISHING BOUNCE P. 92

Available in four grits and a variety of sizes and shapes, rubberized abrasives help solve many special finishing problems. They offer advantages, too, in production finishing. Abrasive-rubber blend cuts or polishes without digging in, tearing or drawing even the softest metals, is unaffected by water or coolants.

MARKETS AND PRICES

SELLING WEST NOT AS SIMPLE AS IT SEEMS P. 46

Expanding markets on the West Coast are making Eastern manufacturers take another look. The big question is whether it is cheaper to fabricate in the east and ship west, or make the products in the west. National Electric is moving back to the East.

IS U. S. HELP COMING FOR SMALL BUSINESS? P. 51

Small business is victim of changing economic conditions. But Cabinet committee recommends tax relief, aid in obtaining government business, and other measures to assist small business in today's economy. But report will not subsidize inefficiency.

WHY LOS ANGELES IS THIRD IN INDUSTRY P. 71

Setting new records, the Coast City expects value of manufactures to reach $6 billion by year's end. It's a fast growing market which Eastern manufacturers aren't satisfying. Aircraft's only part of growth story.

WHAT DO MACHINE TOOL STATISTICS MEAN? P. 73

July shipments of metal cutting, grinding machines dropped off from previous month. Yet shipments are up from a year ago in effort to cut backlogs. New orders aren't too plentiful, might sag more due to price increases.

STEEL MARKET APPROACHING CRITICAL STAGE P. 115

Some steel consumers are living in a fool's paradise. Market demand is moving toward new heights. Fourth quarter scramble will bring even flat-rolled into list of tight products. Automotive will be a big factor.

NEXT WEEK:

BUSINESS BENEFITS FROM AID TO EDUCATION

Business aid to education is running about $100 million a year. That's nearly $200 a minute. But it's worth it. Bread cast upon the educational waters is returning benefits to industry a hundred fold.

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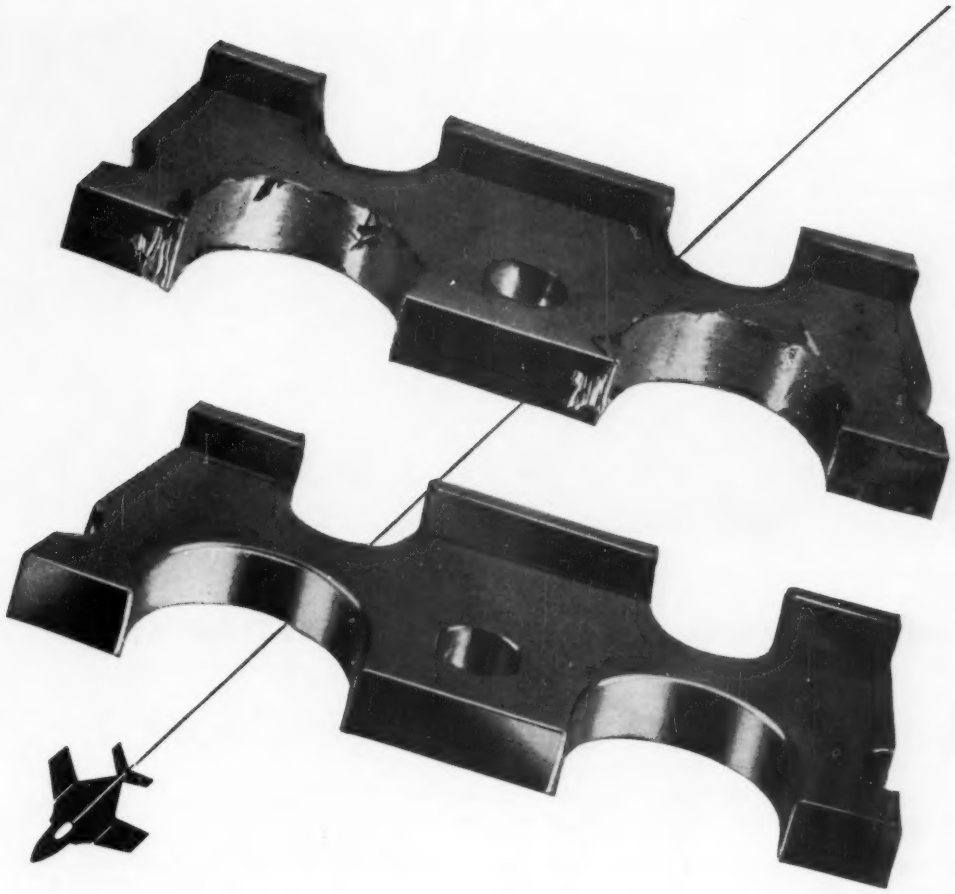

New standard in finishing

EXTREME temperatures and stresses set up in jet engines cause unprecedented strains on metal components.

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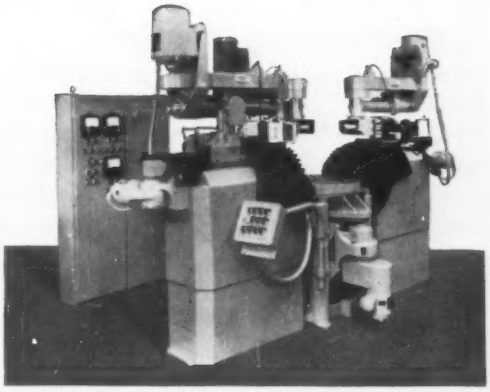
It will pay *you* to have an **O**sborn **B**rushing **A**nalysis made of your finishing operations. Write *The Osborn Manufacturing Company, Dept. F-49, 5401 Hamilton Avenue, Cleveland 14, Ohio.*



Osborn's 51-3L Brushamatic cleans and finishes metallic and non-metallic parts up to 8 feet in diameter, 3500 pounds in weight

COMPLETE DATA—For information on power brushes and brushing methods write today for Osborn's Catalog 300.

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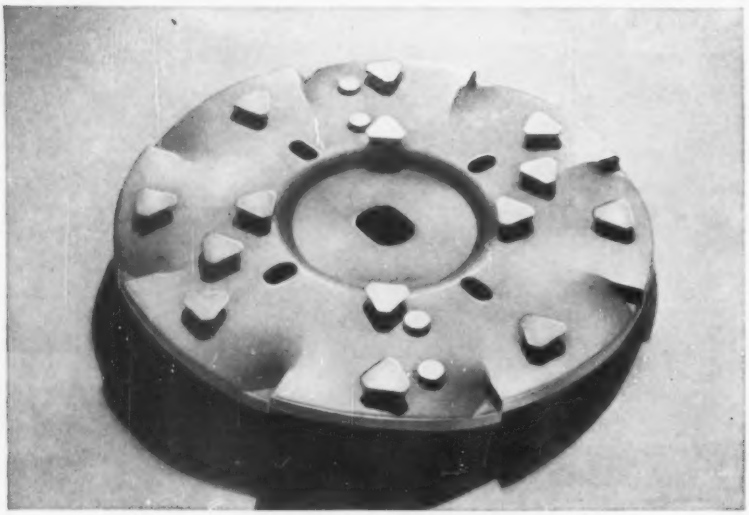

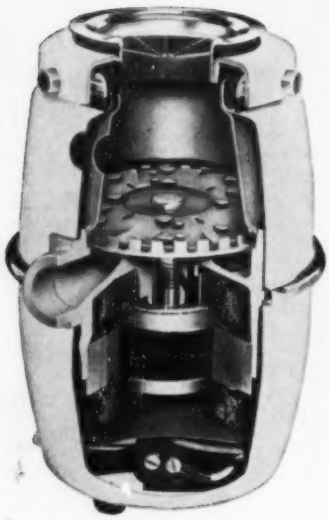

How Armco 17-7 PH Stainless

Makes this part Last Longer, Work Better

Formerly made of chrome-plated carbon steel, this cutter disc for a food waste disposer was reducing the efficiency of the unit. The combination of corrosion and abrasion in grinding food wastes dulled the carbon steel cutting edges.

17-7 PH Solves Problems

Now the cutter discs are made of Armco 17-7 PH Stainless Steel . . . and the troubles are gone. The combination of high hardness and good corrosion resistance obtained with 17-7 PH makes the part much more durable and the cutter has a 15 to 20% faster cutting action.

Fabrication is simplified, too. The cutting blades, 17-7 PH cold-headed rivets, are attached to the formed 17-7 PH disc. Then the assembly is hardened. A simple heat treatment at 1400 and 950 F hardens the entire part to Rockwell C 40.

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This cutter disc is typical of the improved performance and production you can obtain by utilizing the unusual combination of properties you get in Armco 17-7 PH. Extra high strength and hardness, good corrosion resistance and excellent fabricating characteristics give you many new opportunities to improve your product and reduce manufacturing costs as well.

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Indexed in the Industrial Arts Index and the Engineering Index.

BPA NBP

EDITORIAL

Is The FRB A Sacred Cow?

◆ THE COUNTRY is going to need a whale of a lot of money this fall. With the steel strike over, customers need money to lay away stock and make finished products. Auto firms need money as they push for a record number of cars in the fourth quarter.

New plant and equipment projects will need even more money as expenditures reach an annual rate of more than $37 billion. The steel industry will now go full steam ahead on its 15 million ton 3-year expansion program. That is a must.

Consumers will be knocking on the credit door for money to buy the new and completely changed 1957 model cars. Millions more will be buying homes and furniture on time. All that takes cash.

The Federal Government needs a lot more money than it used in the first six months. And by September 15th a lot of plain ordinary people as well as business firms will be borrowing to pay Uncle Sam.

All this has to be carried out in the face of a money market that grows tighter each week. It is clear that a lot of money is being spent to build plant and equipment to provide more material. That will mean an easier materials situation and less stringency; hence less overall bidding for materials in short supply.

More steel capacity, more aluminum, more machinery, better manufacturing methods, adequate defense and solid installment buying do not spell inflation. They mean stabilization.

It looks like the Federal Reserve Board feels—or acts as if it feels—that it is our brother's keeper. Of course the FRB has an important part to play. But if it plays it in an impractical manner, it may not get a chance to play many more such parts.

The FRB believes that we are in for dangerous inflation. So it has again raised the discount rate and made credit far tighter than it should be. There is something to think about here. Those in the FRB who make these decisions should occasionally leave their ivory tower.

The FRB is not a sacred cow. Economics is not an exact science. It is foolhardy to act as if it were. Perhaps there are times when severe control is needed. There are times too when it would be a serious mistake. Let's hope the FRB uses imagination and understanding—along with its next high level guessing.

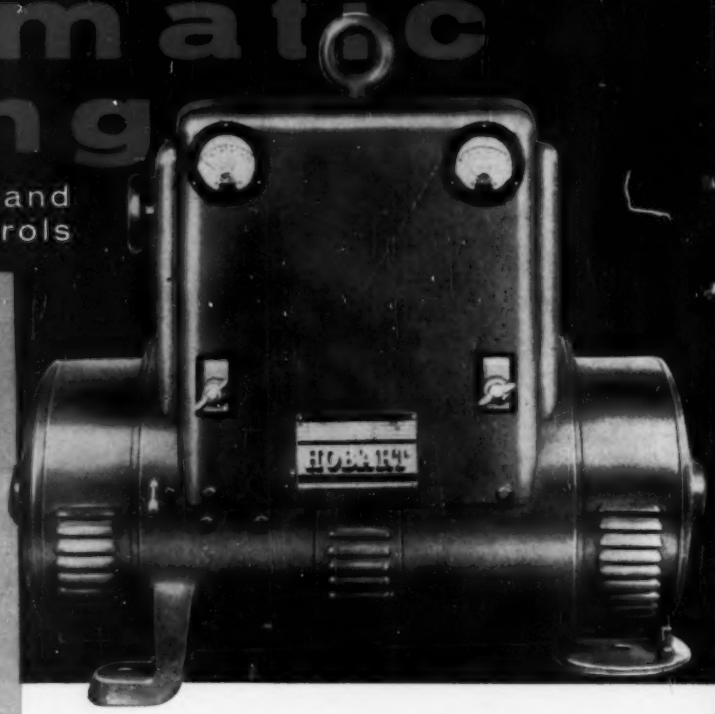
Tom Campbell

EDITOR-IN-CHIEF

HOBART

Automatic welding

. . . with constant voltage and SIMPLIFIED Controls



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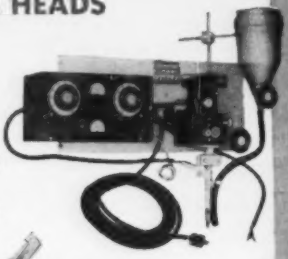
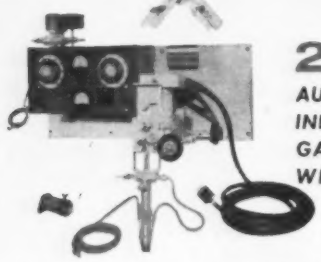
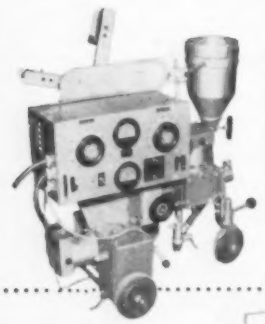
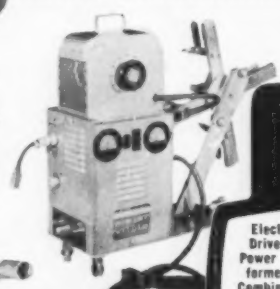




2. FULLY AUTOMATIC INERT GAS WELDING



3. TRACTOR TYPE AUTOMATIC ARC WELDER



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dear editor: *letters from readers*

Let George Do It

Sir:

Your editorial, "Let's let George do it—again," has both my interest and admiration. It bears a timely and important lesson for Americans. I would appreciate a few reprints since I am having my original framed and hung in our lobby. *E. W. Bettinger, President, The Mutual Mfg. & Supply Co., Cincinnati, Ohio.*

Comprehensive Report

Sir:

I have just completed reading your June 28 feature "How to Get More for Your Plating Dollar."

I believe it is a comprehensive and most informative piece of work that I have read in a long time. *H. Brown, Wyandotte Chemicals Corp., New York, N. Y.*

Sound barriers

Sir:

Your July 26 article, "Ultrasonics: Sound Breaks Metalworking Barriers," is very interesting.

The acknowledgment section lists six companies. Would you kindly advise me, if possible, which company could give me the most information on (a) casting application, and (b) heat treatment applications. *M. B. Watson, Atomic Energy of Canada Ltd., Chalk River, Ont.*

These applications are largely in the development stage. Consequently, there is not likely to be available any "commercial" equipment specifically designed for these applications at the present time. Most—if not all—of the equipment manufacturers are anxious to cooperate wherever possible in furthering the usefulness of ultrasonic equipment. In a development project of this sort, it is quite likely that the developer would be expected to bear most of the costs.—Ed.

Practical Business

Sir:

Kindly send me a copy of the August 16 article, "Diversification: Watch the Pitfalls."

This will be kept in my permanent files, because it is one of the very best sets of remarks on practical business I have ever seen. *W. C. Esch, Sales Engineer, Whiting Corp., Harvey, Ill.*

Sir:

May we please have two reprints of Mr. Dalzell's article "Diversification: Watch The Pitfalls," which appeared on page 51 of the August 16 issue of THE IRON AGE?

This was an excellent article and

Dalzell Warns of Pitfalls

we hope that we are not too late in asking for reprints. *A. D. Cronk, Mgr.—Market Research, The Patent Button Co., Waterbury, Conn.*

Sir:

I would greatly appreciate your sending me a copy of the article on "Diversification" which appeared in your August 16 issue.

I found it a most interesting report and you are to be congratulated for publishing it. *M. S. Titleman, Industrial Engineering Dept., Dominion Bridge Co., Ltd., Montreal, Que.*

Somers

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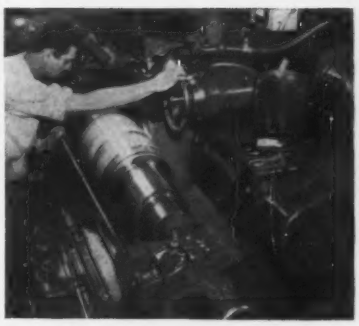
are as
EXACTING AS THIS



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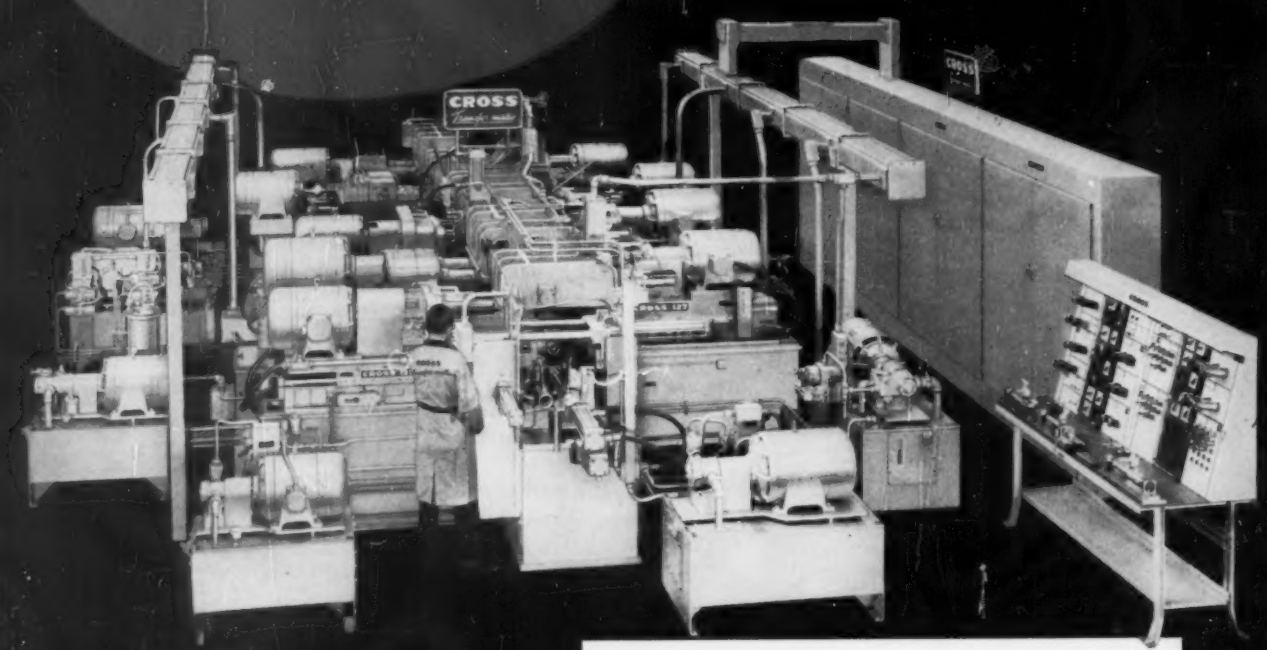
Somers Brass Company, Inc.
102 BALDWIN AVE., WATERBURY, CONN.

Bores, Drills Chamfers, and Taps Rear Axle Housings

Another Transfer-matic by Cross



- ★ Rough and finish bores two tube holes; rough and semi-finish bores differential case bearing seats; rough and semi-finishes pinion shaft bore; drills, chamfers and taps ten cover screw holes.
- ★ 75 pieces per hour at 100% efficiency.
- ★ Twenty-two stations: one for loading, one for unloading, four for boring, two for back-boring, two for drilling, one for tapping, one for turn-over and ten for inspection.
- ★ Lift and carry transfer mechanism.
- ★ Cross Modular Unit Construction provides flexibility for part design changes.
- ★ All parts in Cross Machines—even details—are made to interchangeable tolerances for fast, easy maintenance.
- ★ Other features: Construction to JIC standards, hardened and ground ways, hydraulic feed and rapid traverse for boring and drilling, individual lead screw feed for tapping, automatic lubrication.

Established 1898

THE CROSS CO.

First in Automation

DETROIT 7, MICHIGAN

fatigue cracks

by William M. Coffey

Editors' Choice

From time to time your favorite column has carried a number of mottos along the THINK idea.

You'll remember PLAN AHEAD (with the last three letters squeezed in) and the man who tackled the job that couldn't be done (and couldn't do it).

In most cases, the editors take them from us, groan loudly, and pass them on to the print shop. But here's one that really tickled their editorial palates.

This time *we* groaned.

IN ANYTHING YOU WRITE, BE ACURATE...

Just the Facts, Ma'm

When anyone mentions the word "census" the thing that pops into most people's minds is the great nose counting that goes on in the country every ten years.

The number of people in the U. S., how they live, how much they make, etc., stirs the curiosity of us all.

Not so dramatic perhaps, but vitally important to industry is the less-known Census of Manufactures. For here is an overall view of what industry, not people, has been doing for seven years.

In this vast store of facts and figures can be found clues to shifting markets, growing industries and an accurate measure of how your company stacks up with the competition. But as all good detectives know, it takes digging to turn up the clues.

To make the digging easier, the editors have prepared a special survey report, "How To Hit Your Market," which starts on p. 53 of this issue. It tells how the new Census of Manufactures, now in the first stages of publication, can be put to work in planning your market, realigning sales territories and a number of other marketing activities.

But again, like all good detectives, you should follow up on leads while they're hot. For there won't be any more clues like this for at least another five years.

In gathering material for this report, our editor made the rounds of top marketing experts both in industry and consulting firms. However, one of the most fruitful stops was the Bureau itself.

Here Census officials went overboard in lending a hand through the highways and byways of statistical know-how. Part of his education, of course, was a trip through the Bureau's data processing departments.

Quite impressed by it all, he chanced the remark that computers would some day soon make the timely issuance of reports a simple matter. But he forgot the contrariness of people.

The job now, he was told, is to develop computers fast enough just to keep pace with the mounting statistics generated by our fast-growing population and economy.

New Puzzler

J. Herb, of Westinghouse, says try this one: What is the exact length of a crossed belt connecting two wheels with centers 6 ft apart, and having radii of 1 ft and 2 ft? Thanks, J.

for **Flat Parts** in rugged service

consider **steel plate**

Parts that must be strictly *flat* — of guaranteed accurate thickness and *tough* — often can be stamped from steel plate, economically, with excellent results. Here are a few examples — similar, perhaps, to some you use or are planning.

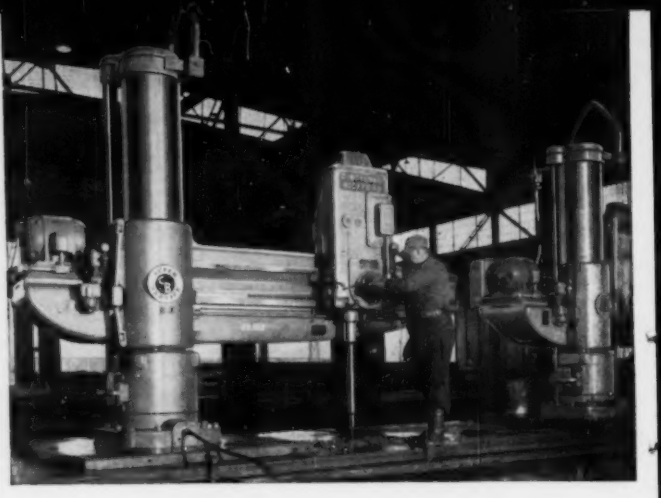
Heavy duty Washers Rings
Discs or Circles Gear Blanks
Sprocket Blanks Special Bosses Drive Plates
Special Shapes, your own design

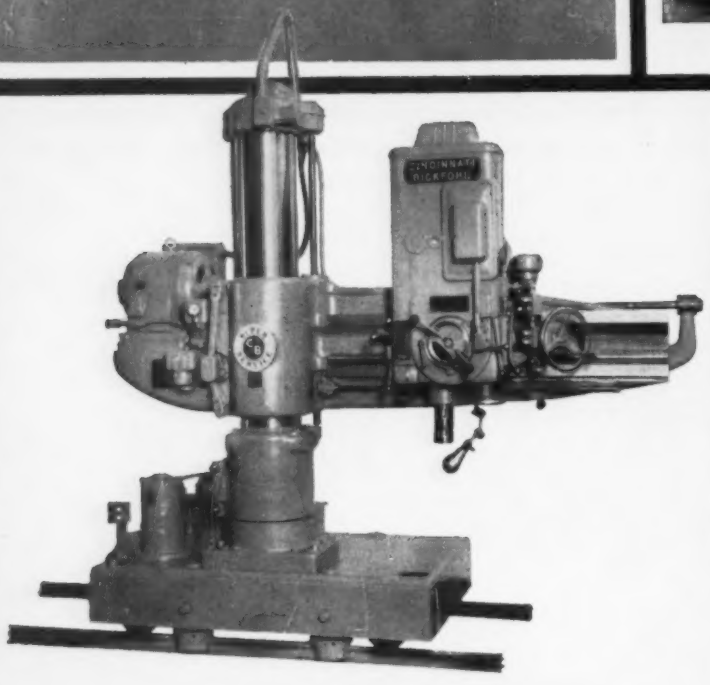
If your steel part starts with a flat disc, for instance — we have stock dies for almost every fractional diameter up to 26½ inches. The heaviest blanking press in the Mid-west accommodates these dies, or those for special shapes to your design, stamping from plate 3/16" to 1-1/4" thick, depending on area.

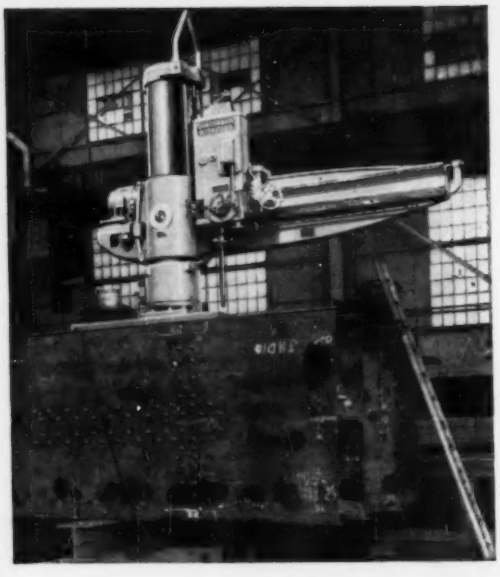
Extra operations available: flame cutting of thicker plate, holes punched (up to .003" accuracy), machining, grinding, drilling and heat treating. Thirty-five hundred ton inventory of mild and high carbon plate . . . Send us your specifications — let us quote you on price and delivery.

Cleveland Pressed Products Corporation
6716 Union Ave., Cleveland 5, Ohio • VUlcan 3-7900

MOVES that save you money





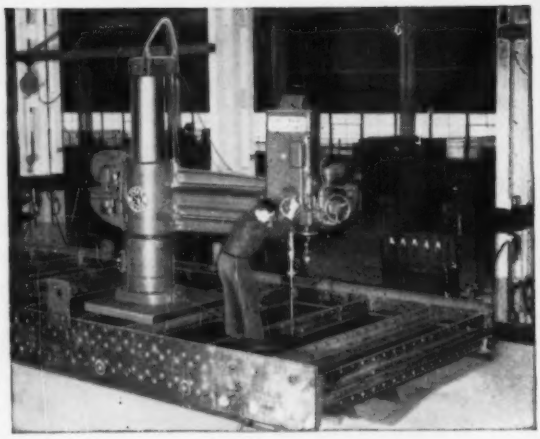


...on the large job!

These portable Cincinnati Bickford Super Service Radial Drills are effecting very large savings, up to 75% on work shown here. It is faster, more accurate and costs less to move the machine, instead of moving the work. Equipped with lifting bail, these machines are so perfectly proportioned and balanced that they need no clamping to work or floor. They do not tip or rise up while drilling.

Inquire about these portable machines—track type, sliding saddle on bed, or merely with stub base and lifting bail—they can save time and dollars for you.

Write for Bulletin R-29.



CINCINNATI BICKFORD

SUPER C·B SERVICE

RADIAL AND UPRIGHT DRILLING MACHINES

CINCINNATI BICKFORD DIVISION

GIDDINGS & LEWIS MACHINE TOOL COMPANY

OAKLEY, CINCINNATI 9, OHIO, U.S.A.

dates to remember

SEPTEMBER

Metal Powder Assn. — Fall meeting, Sept. 7-9, Homestead, Hot Springs, Va. Society headquarters, 420 Lexington Ave., N. Y.

American Institute of Chemical Engineers—Fall meeting, Sept. 9-12, William Penn Hotel, Pittsburgh. Society headquarters, 120 E. 41st, N. Y.

The American Society of Mechanical Engineers,—Fall meeting, Sept. 10-12, Cosmopolitan Hotel, Denver, Colo. Society headquarters, 29 W. 39th St., N. Y.

EXPOSITIONS

The Packaging Machinery Manufacturers' Institute, Sept. 11-14, Cleveland.

Assn. of Iron & Steel Engineers, Sept. 25-28, Cleveland.

Metal Show—Oct. 8-12, Cleveland.

Society of Automotive Engineers—National tractor meeting and production forum, Sept. 10-13, Hotel Schroeder, Milwaukee. Society headquarters, 29 W. 39th St., N. Y.

American Die Casting Institute — Annual meeting, Sept. 11-13, Edgewater Beach Hotel, Chicago. Society headquarters, 366 Madison Ave., N. Y.

Porcelain Enamel Institute — Annual meeting, Sept. 12-14, Broadmoor Hotel, Colorado Springs, Colo. Society headquarters, 1145 19th St., N. W. Washington 6, D. C.

American Society for Testing Materials —Second Pacific area national meeting and apparatus exhibit, Sept. 16-21, Hotel Statler, Los Angeles. Society headquarters, 1916 Race St., Philadelphia.

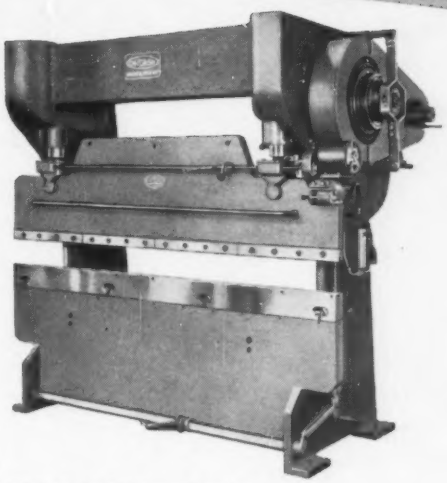
Instrument Society of America—Eleventh annual international instrument-automation conference and exhibit, Sept. 17-21, New York Coliseum, N. Y. Society headquarters, 1319 Allegheny Ave., Pittsburgh.

American Hot Dip Galvanizers Assn.—Semi-annual meeting, Sept. 20-21, Greenbrier Hotel, White Sulphur Springs, W. Va. Assn. headquarters, 1806 National Bank Bldg., Pittsburgh.

Steel Founders' Society of America—Fall meeting, Sept. 24-25, The Greenbrier, White Sulphur Springs, W. Va. Society headquarters, 606 Terminal Tower, Cleveland.

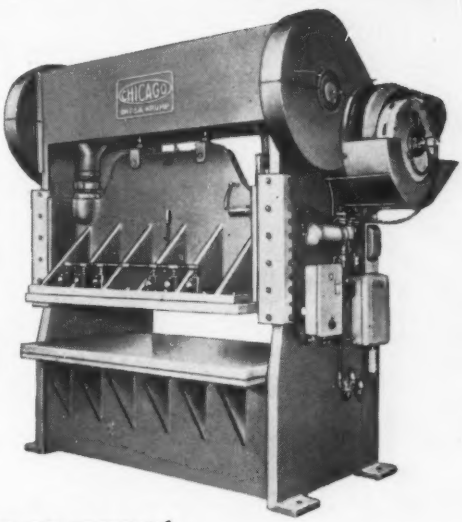
The Material Handling Institute—Fall meeting, Sept. 24-26, The Greenbrier, White Sulphur Springs, W. Va. Society headquarters, 813 Clark Bldg., Pittsburgh.

FASTER
Sheet Metal Operations



Beading
Bending
Blanking
Corrugating
Curling
Drawing
Forming
Joggling
Multiple Punching
Trimming

CHICAGO Press Brakes
Five Models for Sheet Metal Work
11, 30, 36, 50, and 60
Ton Capacities



CHICAGO Straight-Side and Gap Presses with Large Die Area for blanking, punching, trimming, and shallow drawing. Custom built to individual requirements in stroke, die space, and bed area.

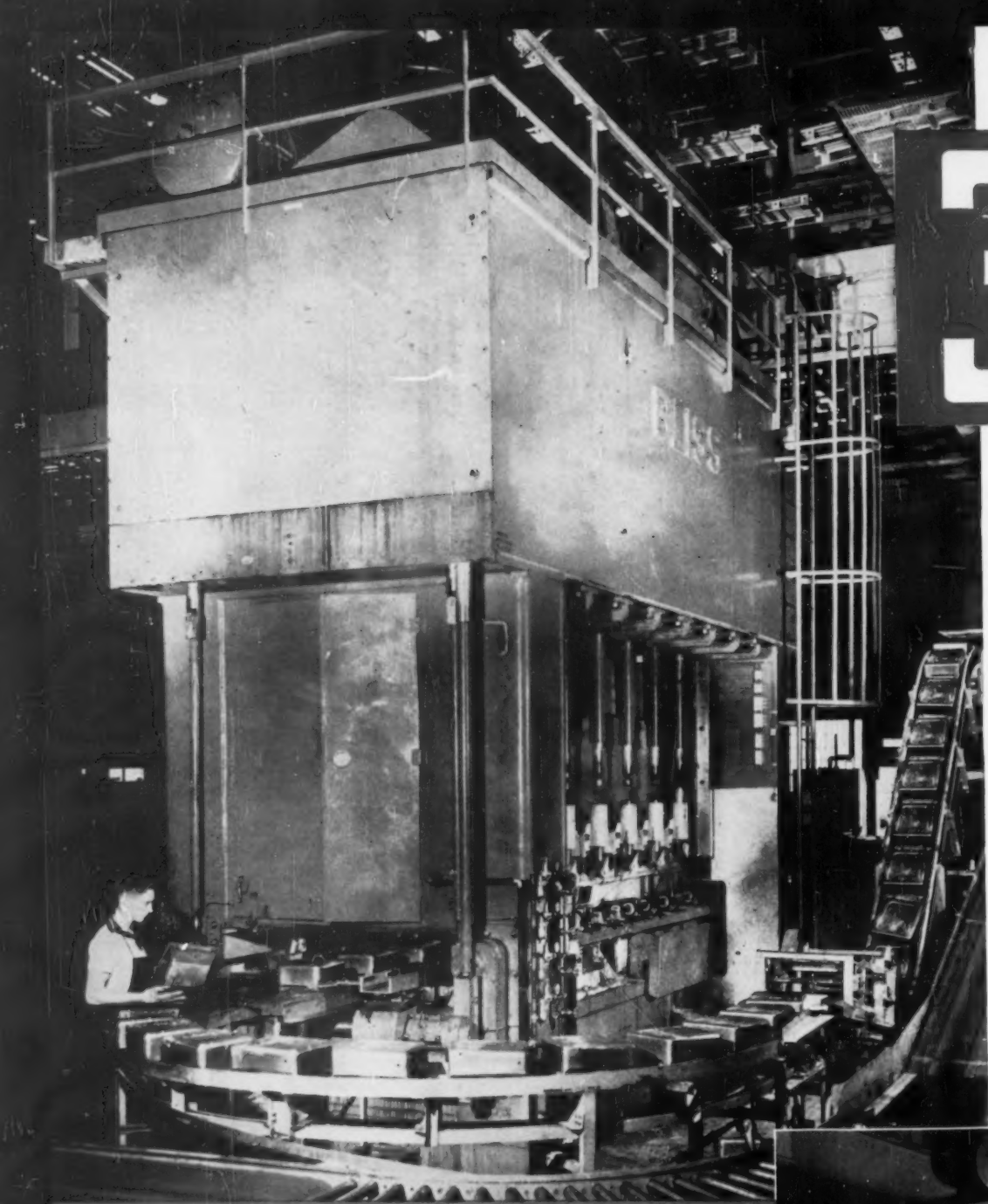
Descriptive Literature on request

4161

CHICAGO DREIS & KRUMP

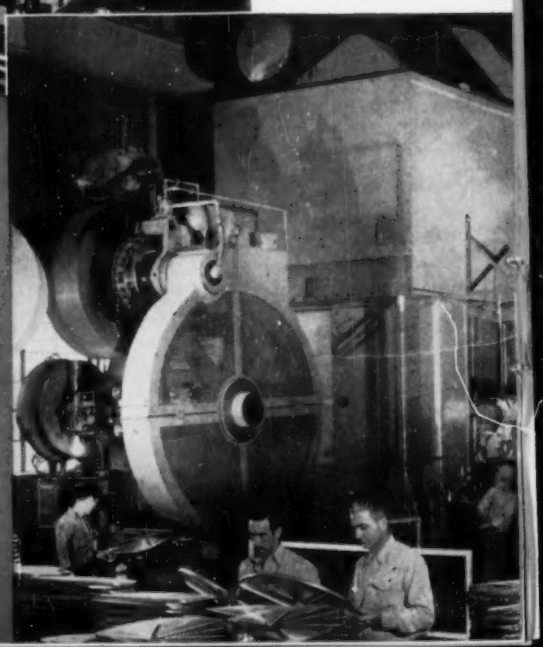
Press Brakes • Straight-Side Presses • Press Brake Dies
Hand and Power Brakes • Special Metal-Forming Machines

DREIS & KRUMP
MANUFACTURING CO.
7430 South Loomis Boulevard, Chicago 36, Illinois



THIS ONE MAKES PANS . . . Pans are produced at the rate of ten a minute in this 700-ton seven-station Bliss transfer feed press. A 22" x 24" blank is drawn 5 1/32" deep in the first station; trimming, piercing and restriking operations follow. Pans leave the press completely finished — ready for pickling and enameling.

THESE TWO MAKE SHELVES . . . "Lazy Suzan" shelves by the millions are the product of these two 800-ton Bliss transfer feed presses and the two Bliss embossing presses stationed at their output ends. Coil stock is blanked in the first stations of the presses and work pieces carry through the remaining five stations and into the embossing press automatically. Each press produces 15 shelves per minute through two shifts.



BLISS TRANSFER FEED PRESSES STEP UP GE REFRIGERATOR PRODUCTION

Between them, they make all the pans and all the shelves GE needs for its annual output of more than half a million refrigerators!

Here's what's happening at Appliance Park: 6000-pound coils of steel feed into one end of these Bliss transfer feed presses, lines of shelves and pans march out the other ends, and only a few attendants stand by in between.

Three separate press lines are involved. One is a 700-ton, seven-station press (with coil cradle, straightener and roll feed) that produces ten deep-drawn pans a minute.

The other two — identical set-ups — are 800-ton, six-station presses, also with cradle, straightener and feed, which feed into 800-ton embossing presses (see photo). Each produces shelves at the rate of 15 per minute.

The method of operation is the same for all. Mill coils are loaded on the cradle. From there, strip feeds through the straightener and into the roll feed. At the first die station in the press a blank is cut off. The transfer feed fingers move in on the work piece and carry it to the next station. As the slide comes down, the fingers move out; as it rises, they move in and repeat the cycle. New strip is brought to the first station and a completed part delivered with every stroke of the press.

This set-up has solved a number of knotty problems for General Electric. Previously production required the services of two or three vendors, doubling and tripling the cost of dies and labor. Still further savings have come from the use of standard mill coils instead of blanks. In fact, the savings are expected to bring about an early amortization of the entire installation.

Bliss has been building transfer feed presses and systems like this since Spanish-American War days; today, over a thousand are in use. If you're faced with long-run production problems, let a Bliss engineer show you some typical uses of the transfer feed principle. Perhaps it can pull your production costs into line — as it has for so many others.

SEE IT IN ACTION . . . *A new color-and-sound movie takes viewers to the plant, shows the press in action. See close-ups of tooling, of transfer fingers, of coil feed techniques. To arrange a showing at your plant, write to E. W. Bliss Company, Canton, Ohio, or see your local Bliss representative.*

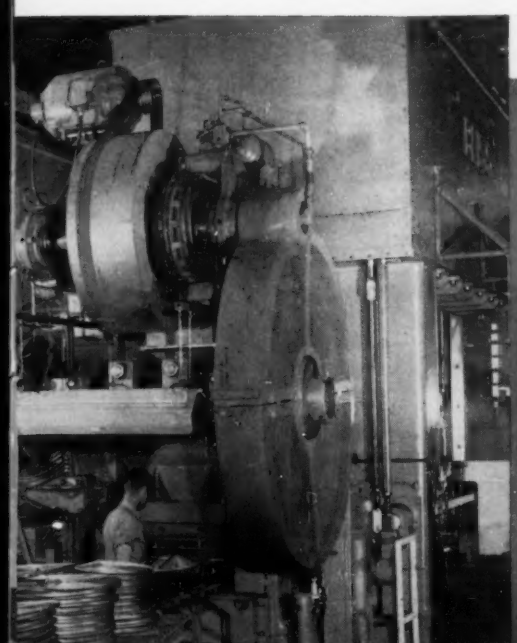
BLISS
SINCE 1857

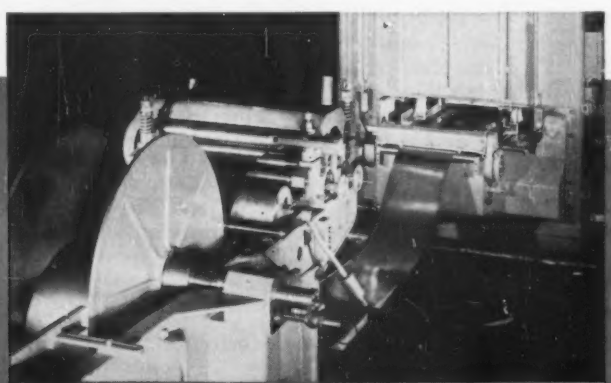
E. W. BLISS Company, Canton, Ohio

PRESSES, ROLLING MILLS, SPECIAL MACHINERY

is more than a name . . . it's a guarantee

U. S. *Plants in* Canton, Cleveland, Salem and Toledo, Ohio; Detroit and Hastings, Michigan; Midland and Pittsburgh, Pa.; San Jose, Calif. ***Branch Offices in*** Burbank, Chicago, Cleveland, Dayton, Detroit, Indianapolis, New Haven, New York, Philadelphia, Rochester, San Jose, Salem, Toledo, Washington, D. C.; and Toronto, Ontario, Canada; E. W. Bliss (England) Ltd., Derby; E. W. Bliss Co. (Paris), France. ***Other representatives throughout the world.***





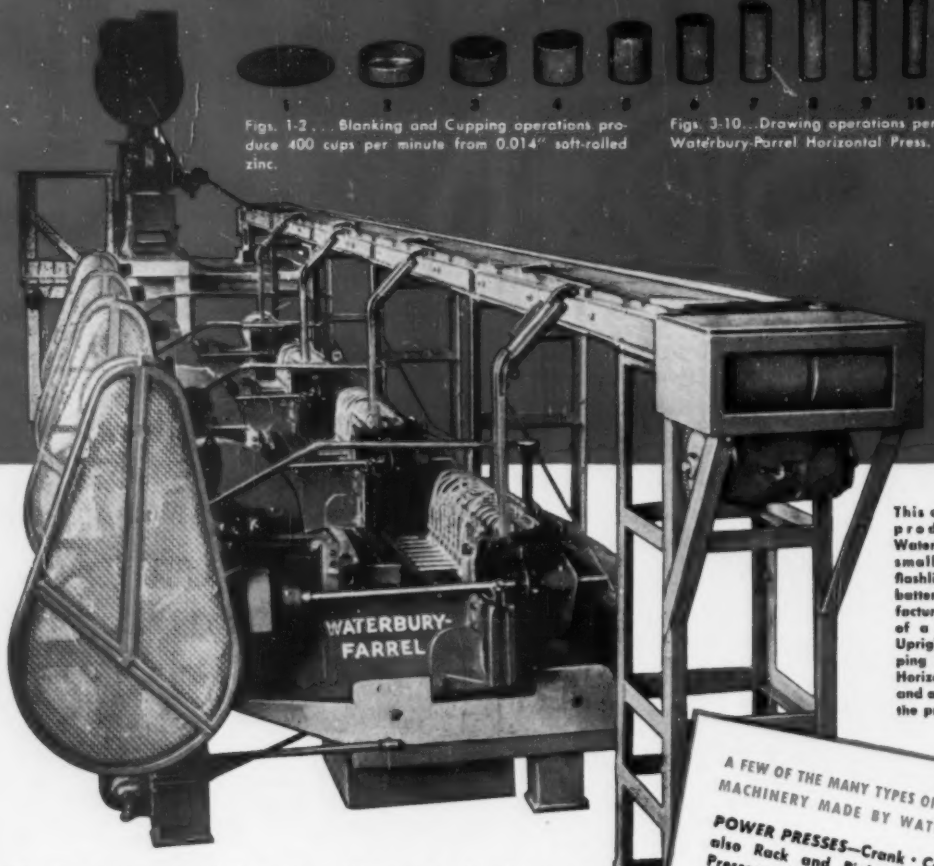
ALL THREE LINES WORK FROM COIL STOCK . . . A number of handling operations are eliminated because, on each of the three presses, strip from standard-sized mill coils are fed from this power coil cradle through a five-roll straightener and into the roll feed on the press. Blank is cut off in the first die station of the press. Though not shown here, a second coil is ordinarily held ready at the rear of the cradle to speed handling. Bliss engineers designed all the coil handling equipment and all of the tooling for each of the presses.

THIS WATERBURY-FARREL PRESS PRODUCTION TEAM

draws 340 shells per minute

Figs. 1-2 . . . Blanking and Cupping operations produce 400 cups per minute from 0.014" soft-rolled zinc.

Figs. 3-10 . . . Drawing operations performed by each Waterbury-Farrel Horizontal Press.



This complete, automatic production unit by Waterbury-Farrel produces small zinc containers for flashlight and hearing aid batteries for a large manufacturer. The unit consists of a 40-ton Double-acting Upright Blanking and Cupping Press, four 7-station Horizontal Drawing Presses and a conveyor which feeds the presses.

Here's an example of the automatic mass production you can get with Waterbury-Farrel horizontal drawing presses.

These modern deep-drawing machines are available singly or in complete production line setups. The presses are available in a wide range of sizes for handling a large variety of work. The number of stations range from 5 to 12; maximum strokes from 3" to 26"; production speeds up to 100 per minute.

Features Include:

- High production — continuous deep drawing with no intermediate annealing.
- Patented shell transfer mechanism.
- Patented die-holder lubrication.
- Horizontally held shells cannot be deformed by trapped liquid.

For further details, write, wire or phone your nearest Waterbury-Farrel office.

A FEW OF THE MANY TYPES OF METAL WORKING MACHINERY MADE BY WATERBURY-FARREL

POWER PRESSES—Crank • Cam and Toggle; also Rack and Pinion Presses • Transfer Presses • Multiple Plunger Presses • Hydraulic Presses, etc. **WIRE MILL EQUIPMENT**—Continuous Fine Wire Drawing Machines, including upright Cone and Tandem types Bull Blocks • String-up Machines • Spoolers, etc. • **COLD PROCESS BOLT AND NUT MACHINERY**—Headers (all types) • Re-headers • Trimmers • Thread Rolling Machines Slotters • Nut Tappers, etc. • **MILL MACHINERY**—Rolling Mills • Wire Flattening Mills, Chain Draw Benches • also Slitters • Straighteners • Pointers • Swagers • Cut-off Saws Coilers • Winders, etc.

FOUNDED WATERBURY FARREL 1851

In Equipment, Experience Counts . . .

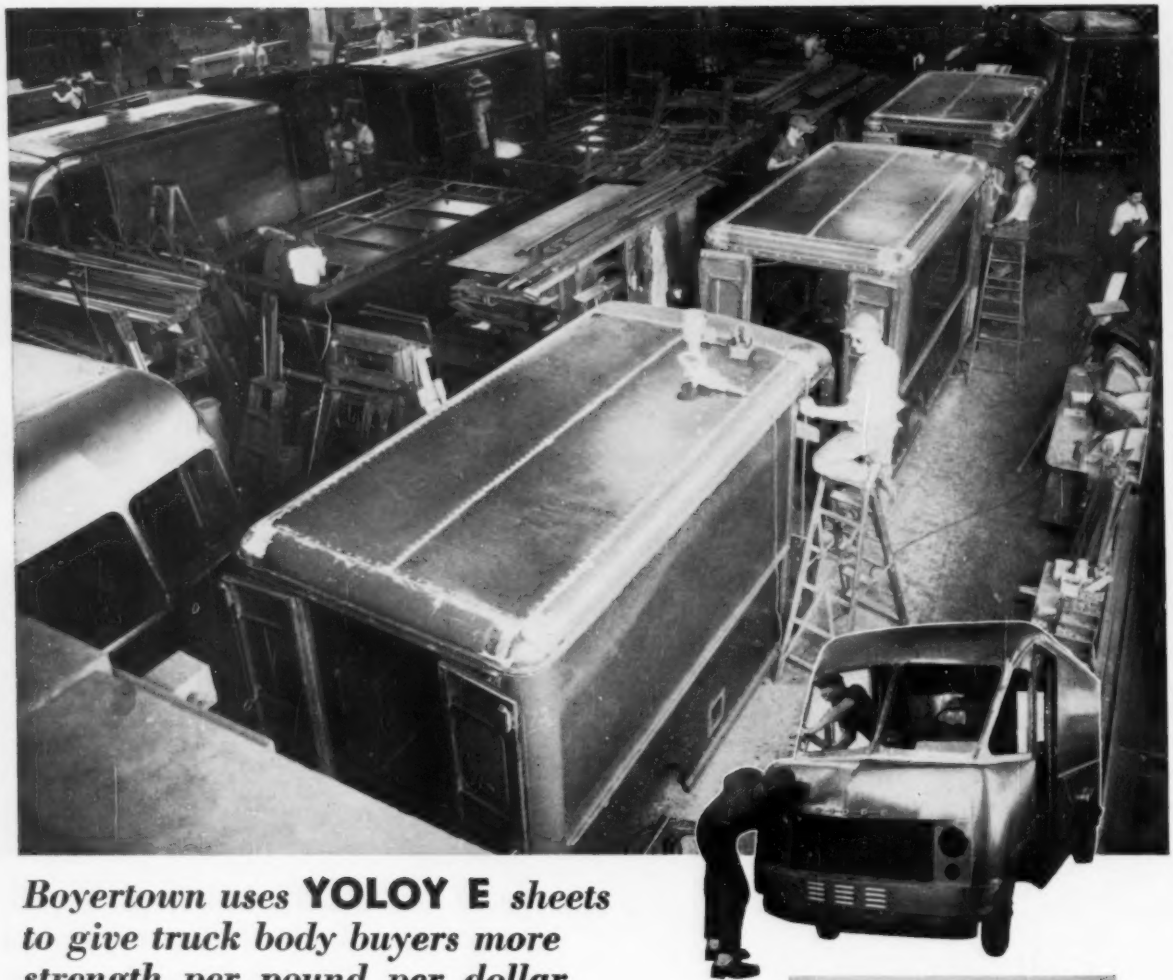
WATERBURY FARREL FOUNDRY & MACHINE COMPANY

WATERBURY, CONNECTICUT • *Sales Offices:* Chicago, Ill., Cleveland, O., and Millburn, N. J.

In those hard-to-get-at places ...for fine finishes and precision accuracies...use mounted wheels by CARBORUNDUM. For the most experienced advice on how to use mounted wheels in your shop, call your distributor or ask the man from CARBORUNDUM

REGISTERED TRADE MARK

Write for CARBORUNDUM'S *wall chart on die harbering abrasives, to: The Carborundum Company, Niagara Falls, New York. In Canada: Canadian Carborundum Company, Ltd., Niagara Falls, Ont.*



Boyertown uses **YOLOY E** *sheets to give truck body buyers more strength per pound per dollar*

"More strength per pound per dollar" is the theme Boyertown Auto Body Works, Inc., uses to sell its delivery-type truck bodies. Chief contributing factor to this selling argument is the high-strength material of which the bodies are made—Youngstown Yoloy "E" Sheets.

Here is what Boyertown's own advertising says about Yoloy "E"—"It's light, strong and corrosion-resistant. It absorbs the punishing stop-and-go strains of day-in day-out dairy route driving with a minimum of maintenance. This corrosion-resistance and additional strength is a premium of longer life and durability at no extra cost."

Demand for Boyertown units is at an all time high. The Company is so confident of the future success of its Yoloy "E" built equipment that a new plant is now under construction which will increase production capacity some 40%.

Every body manufacturer—in fact, every builder of machines or equipment where extra strength, lighter weight and increased corrosion resistance are important—will be interested in the unusual properties of the Youngstown Yoloy Family of Steels. Get in touch with the District Sales Office that serves your area, or write the home office.

THE YOLOY FAMILY

High in resistance to corrosion, shock and vibration, easy to fabricate, easy to weld.

YOLOY
(Nickel-Copper)
Low Alloy High Strength Steel

YOLOY E
(Nickel-Chrome-Copper)
Low Alloy High Strength Steel

YOLOY C
(Chrome-Copper)
Corrosion Resistant Steel

Youngstown

QUALITY YOUNGSTOWN SERVICE

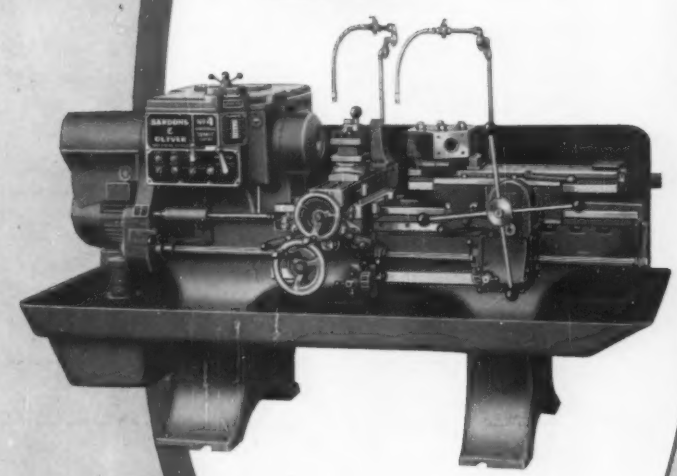
THE YOUNGSTOWN SHEET AND TUBE COMPANY *Manufacturers of Carbon, Alloy and Yoloy Steel*

General Offices Youngstown, Ohio District Sales Offices in Principal Cities.

SHEETS - STRIP - PLATES - STANDARD PIPE - LINE PIPE - OIL COUNTRY TUBULAR GOODS - CONDUIT AND EMT - MECHANICAL TUBING - COLD FINISHED BARS - HOT ROLLED BARS - WIRE - HOT ROLLED RODS - COKE TIN PLATE - ELECTROLYTIC TIN PLATE - BLACK PLATE - RAILROAD TRACK SPIKES - MINE ROOF BOLTS

HARDENED & GROUND

Alloy Steel Bed Ways . . . can mean the difference between normal turret lathe life and very rapid deterioration



• To insure the long life accuracy of Bardons & Oliver Turret Lathes, bed ways are of hardened and ground alloy steel and are replaceable. Final superfinishing provides frictionless carriage travel. Closely spaced alloy steel studs hold the bed ways rigidly to the bed. The front bed way extends beneath the headstock to provide longer bearing for, and increased rigidity of, the cross slide carriage.

The integrally cast headstock and bed assures permanent alignment of spindle and bed ways. Diagonal "V" ribbing between the bed walls extends for the entire length of bed and beneath the headstock.

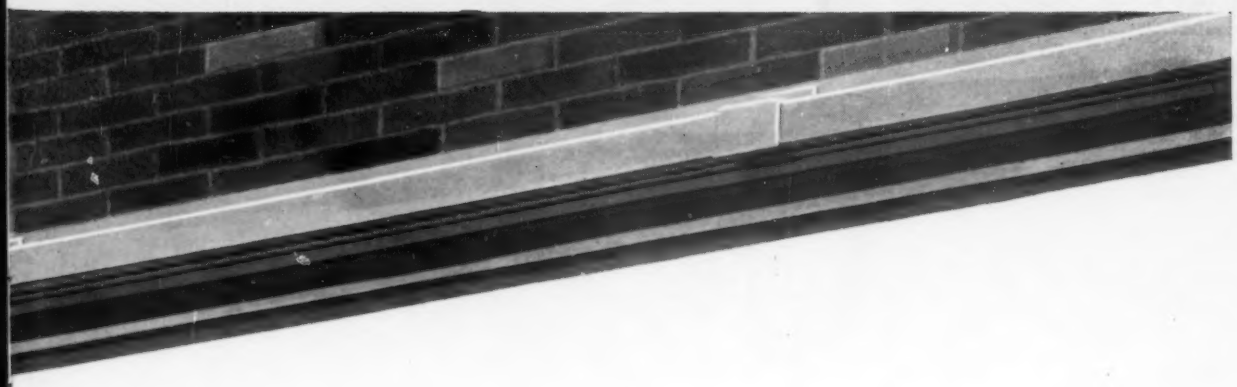
The superior design combination of headstock, bed and bed ways is only one of the features we are proud to offer. For complete information on the advantages of Bardons & Oliver Turret Lathes, write us on your company letterhead.

Manufacturers of a complete line of Turret Lathes and Cutting-Off Lathes.

BARDONS & OLIVER, INC.

1136 WEST 9TH STREET • CLEVELAND 13, OHIO

OPEN
FOR
BUSINESS



New refractories plant at Columbiana, Ohio, to give better-than-ever service to the steel industry!

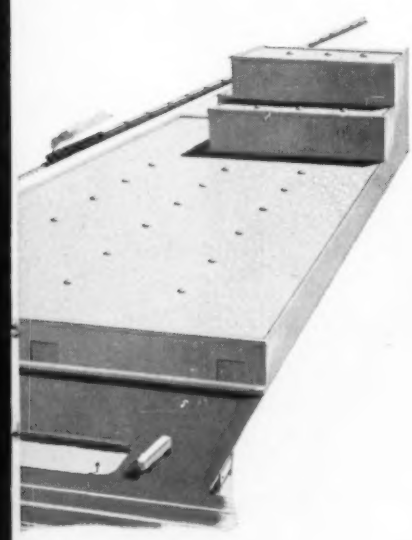
THE NEW Kaiser Chemicals refractory plant at Columbiana, Ohio has now begun production of steel furnace refractories.

Located on a 100 acre site adjacent to the main line of the Pennsylvania Railroad and the Ohio-Pennsylvania Turnpike, the new Columbiana plant assures rapid rail and truck transportation to steel producers in the Midwest and East.

Already serving the nation's steel industry from three plants in California, this new *Kaiser Chemicals* facility means new production to meet the increasingly heavy demand for Kaiser refractories. The new Columbiana plant will manufacture basic brick, mostly of the Periclase Chrome and Chrome Periclase types in addition to Permanente Ramming Mixes for refractory furnaces.

All these refractories are *especially designed* for peak performance in specific applications in open hearth and electric steel furnaces. In fact, for more than 12 years Kaiser Periclase Chrome and Chrome Periclase Brick have *set the standard* of performance for the industry. *That is why more and more steel producers regard them as the most dependable refractories available today!*

If you have a problem in your mill which might be solved by the *prompt delivery* of *superior quality, dependable refractories,* why not get in touch with us?



For more information call our nearest Sales Office: Kaiser Chemicals Division, 1924 Broadway, OAKLAND 12, Calif. . . . 3 Gateway Center, PITTSBURGH 22, Pa. . . . 518 Calumet Bldg., 5231 Hohman Avenue, HAMMOND, Indiana.

To obtain free copies of Kaiser Chemicals product literature write Kaiser Aluminum & Chemical Sales Inc., 1924 Broadway, OAKLAND 12, California, Dept. S6112.

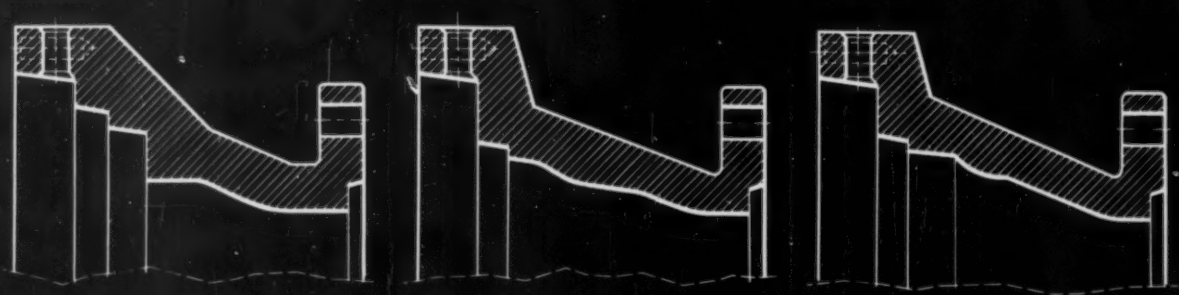
Kaiser Chemicals

Pioneers in Modern Basic Refractories

Refractory Brick & Ramming Materials • Castables & Mortars • Magnesite
Periclase • Deadburned Dolomite

before you buy a tracing lathe,

find out how economically



you can . . .

add HYDRA-TRACE* to your Present LeBlond

American Cast Iron Pipe Co. did! Now they have all the advantages of a "new" tracing lathe, at a fraction of new-lathe cost. Actually, Hydra-Trace Duplicating Attachment is quickly and easily installed on most any LeBlond Lathe built since 1935.

This tracing-boring job at American Cast Iron Pipe Co., Birmingham, Ala., is a good example of Hydra-Trace performance. Bells for centrifugal pipe molds are machined internally with Hydra-Trace feeding at 30° angle. The part is finished in one-third time required for hand-fed turning. Details of the machining operation were worked out by LeBlond engineers, who prepared prints and template pattern for American.

LeBlond offers a wide variety of useful turning attachments. Because of the inherent stamina of LeBlond machines, our customers often solve special turning problems by adding to their present machine—good for many more years of dependable service.

Perhaps you, as a LeBlond Lathe owner, have a tracing job made to order for Hydra-Trace. Our field engineers are always on call, ready to work with you in solving your specific turning problems. Write today and tell us your needs.

*Hydra-Trace (Trade Mark registered U.S. Pat. Off.) is LeBlond's heavy-duty hydraulic tracing attachment. Can be mounted in place of compound rest on practically all LeBlond lathes built since 1935.

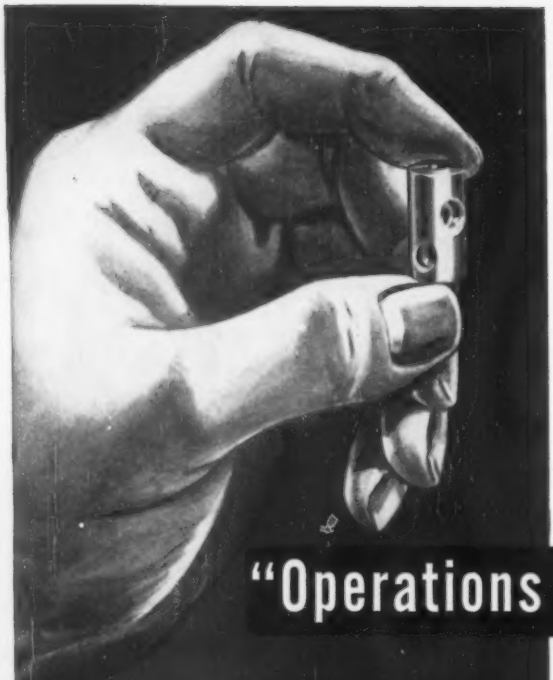
Simply adding HYDRA-TRACE made a tracing lathe of this five-year-old 32" LeBlond Heavy Duty—at small cost. These parts call for tracing-boring operation. Material #1025 steel; spindle speed 35 rpm; feed .016; carbide tool; finish 60 micro-inches; tolerance ±.0025. Machining time 3 hours, one-third time required for hand-fed turning.

. . . cut with confidence

LeBLOND of Cincinnati

THE R. K. LEBLOND MACHINE TOOL COMPANY
CINCINNATI 8, OHIO

World's largest builder of a complete line of lathes for more than 69 years

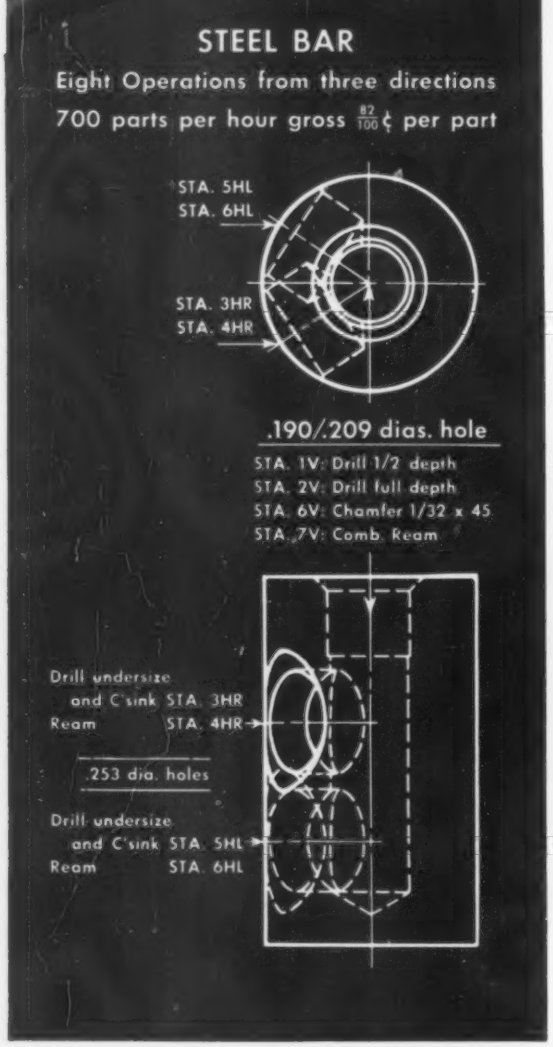


How would you jig and set up to perform nine operations on these three holes simultaneously in 5.11 seconds for 82/100¢ per part?

At first glance it looks like a cinch! . . . just use three drilling units with combination tools!

But each hole must also be reamed, and the part has no fixed locating point for a second chucking . . .

"Operations Kingsbury" maintains high

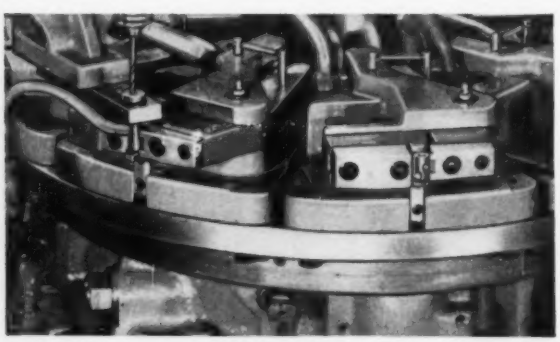


The part is a steel cylinder ½ inch diameter and 13/16 inch long. Vertical hole is along the axis. Horizontal holes are located on two levels, 67° apart.

Manually-operated work-holding fixtures are designed to hold the part with the axis vertical. It is seated firmly against locators at the bottom, back and left-hand side, and clamped from the right. All operations are performed without removing the part from the fixture.

Six Kingsbury units are mounted on a 60-inch base. Eight work-holding fixtures are mounted on a 20½-inch table, which indexes through eight stations, one used for loading and unloading.

At Stas. 1 and 2 a vertical unit is equipped with a two-spindle auxiliary head. At Sta. 1-V, one spindle drills the .190 dia. axial hole undersize to half depth. A bushing guides the drill. At Sta. 2-V the second spindle drills the hole to full depth. This two-stage operation



Eight precision-built fixtures accurately mounted on the Kingsbury dial assure perfect interchangeability.

is necessary in order to complete this work within the required time period.

At Sta. 3-HR a horizontal unit with combination tool drills the upper (right hand) .253 dia. hole undersize to connect with the axial hole. It also forms the countersink. A similar unit at Sta. 4-HR reams this hole. Bushings guide the tools.

Identical operations are performed on the lower (left hand) hole at Stas. 5-HL and 6-HL.

At Stas. 6 and 7, a vertical unit is equipped with a two-spindle auxiliary head. Spindle at Sta. 6-V chamfers the axial hole 1/32 x 45°. Spindle at Sta. 7-V combination step-reams the hole to .190/.209 diameters, removing the burrs from the break-through of the two horizontal holes.

* * *

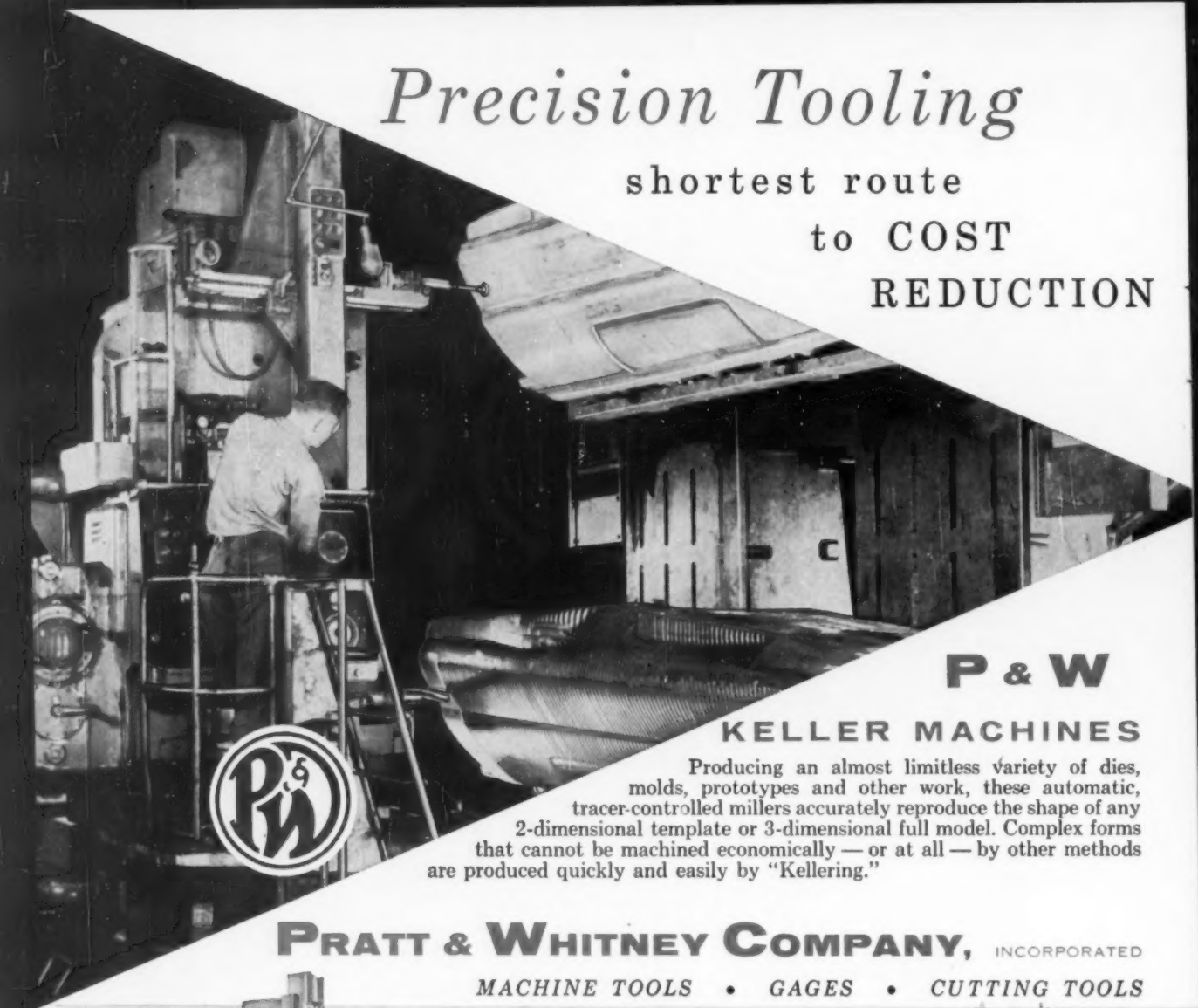
Going back to our first premise: it's a cinch — *on a Kingsbury*. But what makes it a cinch? Specially designed work-holding fixtures that are uniformly accurate. Kingsbury heads, bases, indexing tables, electrical controls — all working together in perfect *automation* — *plus* the experience and skill of our engineers who are always looking for better ways to make better Kingsburys. Let us show you!

Kingsbury Machine Tool Corp.
118 Laurel St., Keene, N. H.

production of interchangeable parts at low cost

Precision Tooling

shortest route to COST REDUCTION

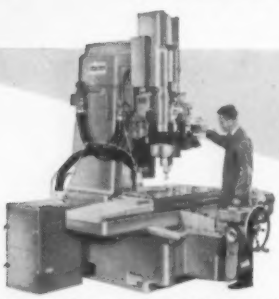


P & W KELLER MACHINES

Producing an almost limitless variety of dies, molds, prototypes and other work, these automatic, tracer-controlled millers accurately reproduce the shape of any 2-dimensional template or 3-dimensional full model. Complex forms that cannot be machined economically — or at all — by other methods are produced quickly and easily by "Kellering."

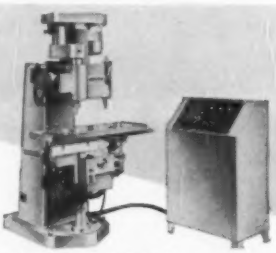
PRATT & WHITNEY COMPANY, INCORPORATED

MACHINE TOOLS • GAGES • CUTTING TOOLS



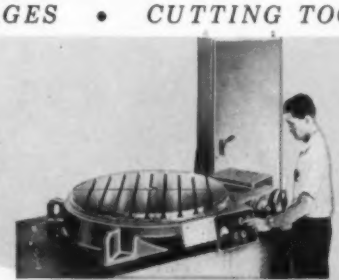
2E VERTICAL PRECISION HOLE GRINDER

"Tenths" accuracy plus grinding speeds to 100,000 rpm.



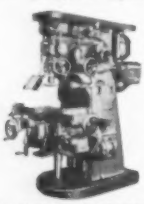
"VELVETRACE" MILLING MACHINE

Ultimate in accuracy for 3-dimensional tracer-controlled reproduction.



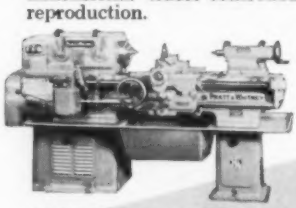
PRECISION ROTARY TABLES

Rugged, accurate to seconds! Automatic, plain, tilting and vertical types; 10" to 50" diameters.



PLAIN AND UNIVERSAL DIE SINKERS

Extra power and stamina to handle today's tougher die steels with speed, accuracy.



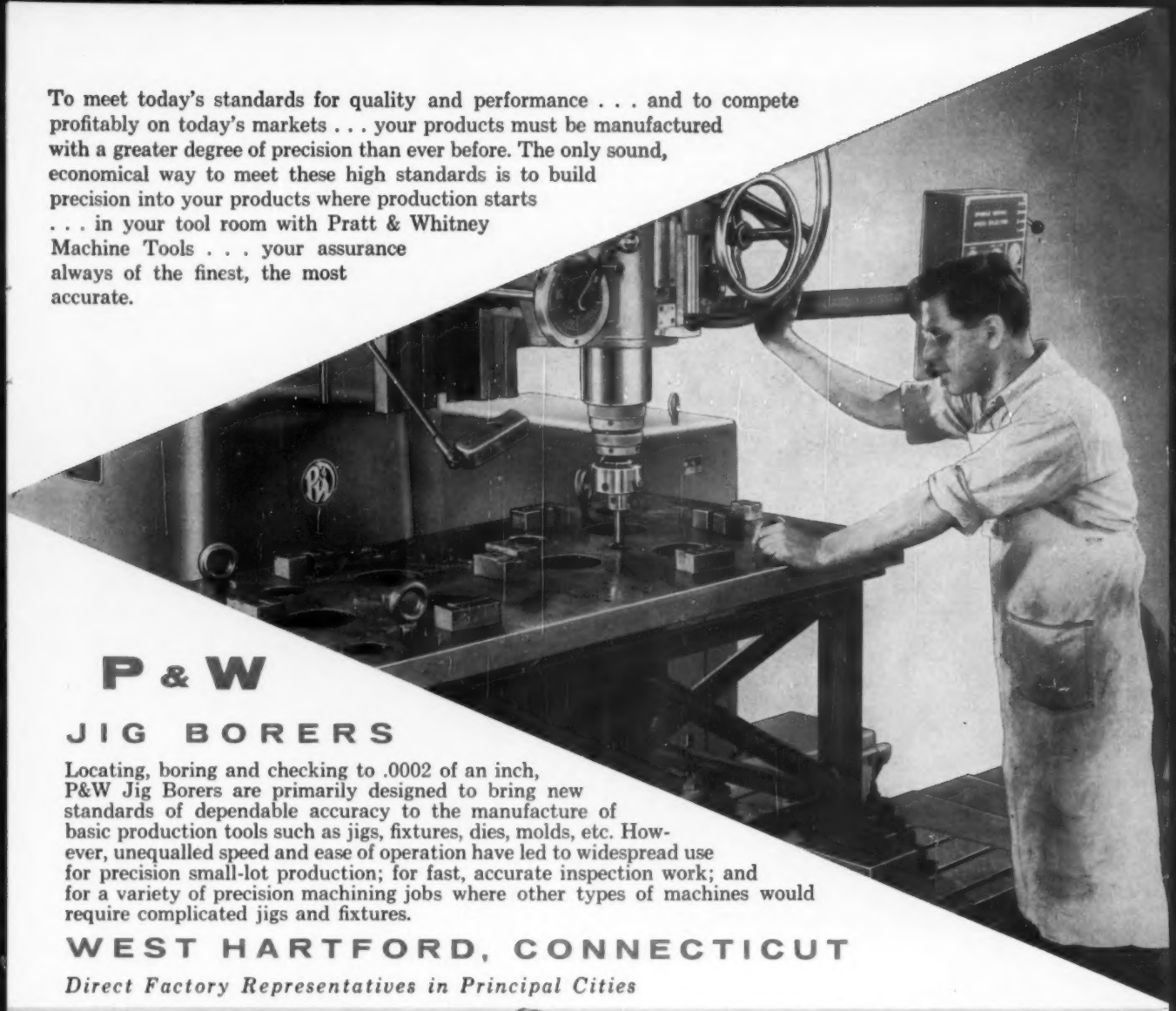
MODEL C LATHES

Traditionally the finest wherever highest precision is essential . . . now even better.

CUTTER and RADIUS GRINDERS

Grinds virtually every type of standard and special cutter . . . quickly and accurately.

To meet today's standards for quality and performance . . . and to compete profitably on today's markets . . . your products must be manufactured with a greater degree of precision than ever before. The only sound, economical way to meet these high standards is to build precision into your products where production starts . . . in your tool room with Pratt & Whitney Machine Tools . . . your assurance always of the finest, the most accurate.



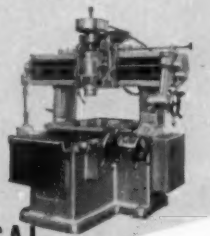
P&W

JIG BORERS

Locating, boring and checking to .0002 of an inch, P&W Jig Borers are primarily designed to bring new standards of dependable accuracy to the manufacture of basic production tools such as jigs, fixtures, dies, molds, etc. However, unequalled speed and ease of operation have led to widespread use for precision small-lot production; for fast, accurate inspection work; and for a variety of precision machining jobs where other types of machines would require complicated jigs and fixtures.

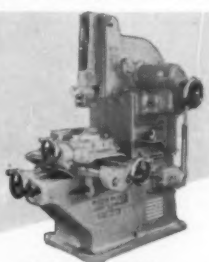
WEST HARTFORD, CONNECTICUT

Direct Factory Representatives in Principal Cities



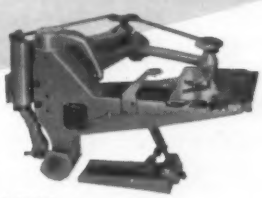
VERTICAL MILLERS AND PROFILERS

Economical production profiling of irregular shaped parts.



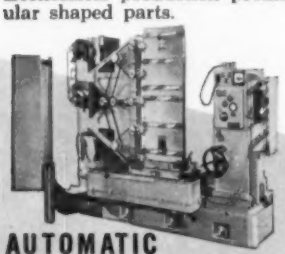
VERTICAL SHAPERS

Handiest machine in any shop for fast, accurate handling of irregular shaped work.



DIAFORM WHEEL FORMING ATTACHMENTS

Form-trues grinding wheels, accurate to "tenths" in minutes; saves time, money.

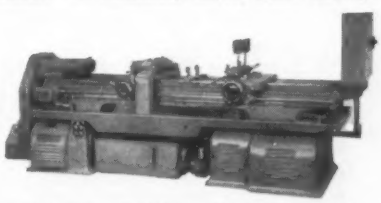


AUTOMATIC DUPLICATING MACHINES

Duplicates die and bottle mold sections . . . quickly, accurately, economically.

MODEL C THREAD MILLERS

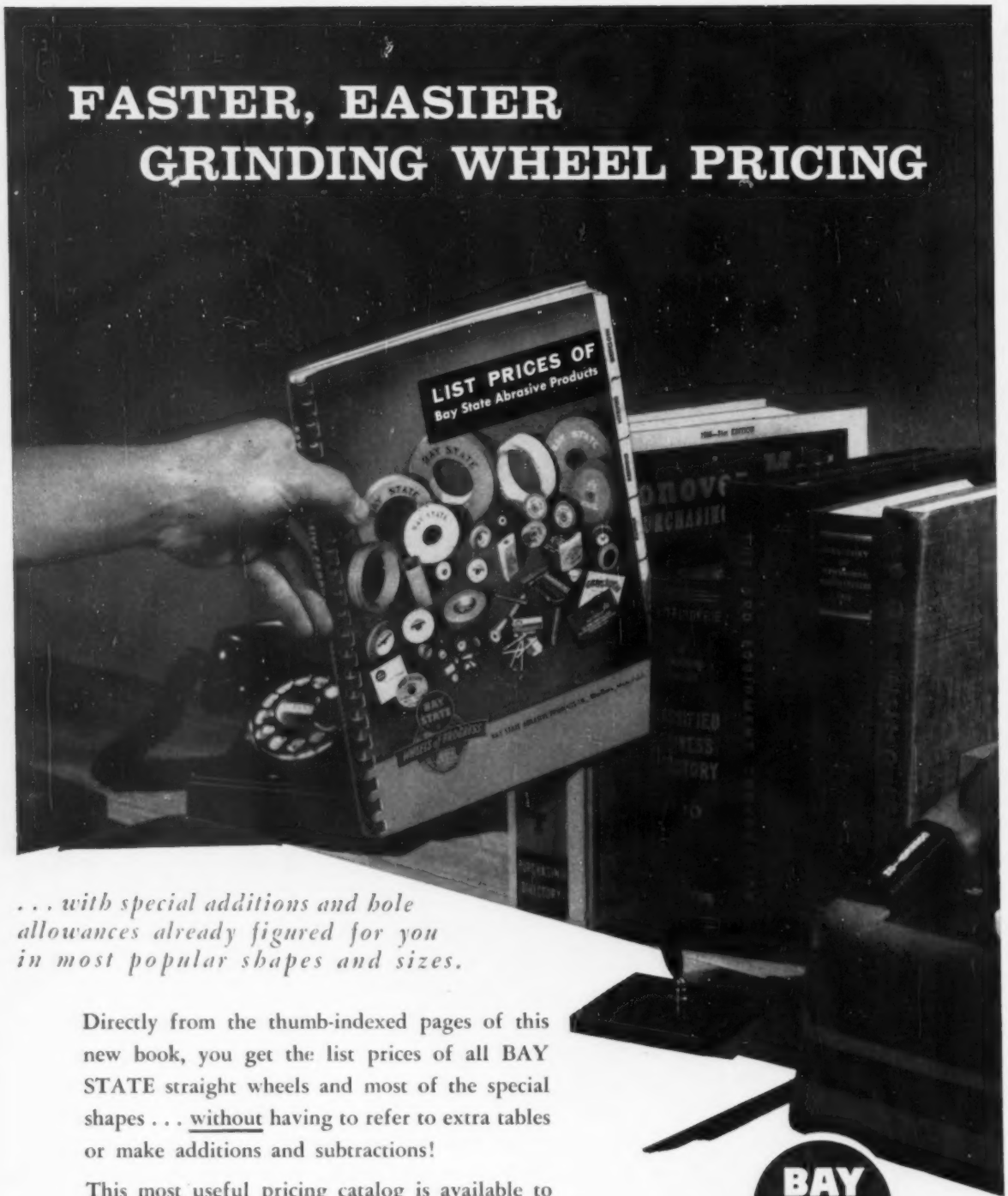
Unusually versatile; sets new standards for accuracy, finish and economy.



DEEP HOLE DRILLERS

Twin drilling units produce true holes up to 129" deep in a single, uninterrupted operation.

FASTER, EASIER GRINDING WHEEL PRICING



. . . with special additions and hole allowances already figured for you in most popular shapes and sizes.

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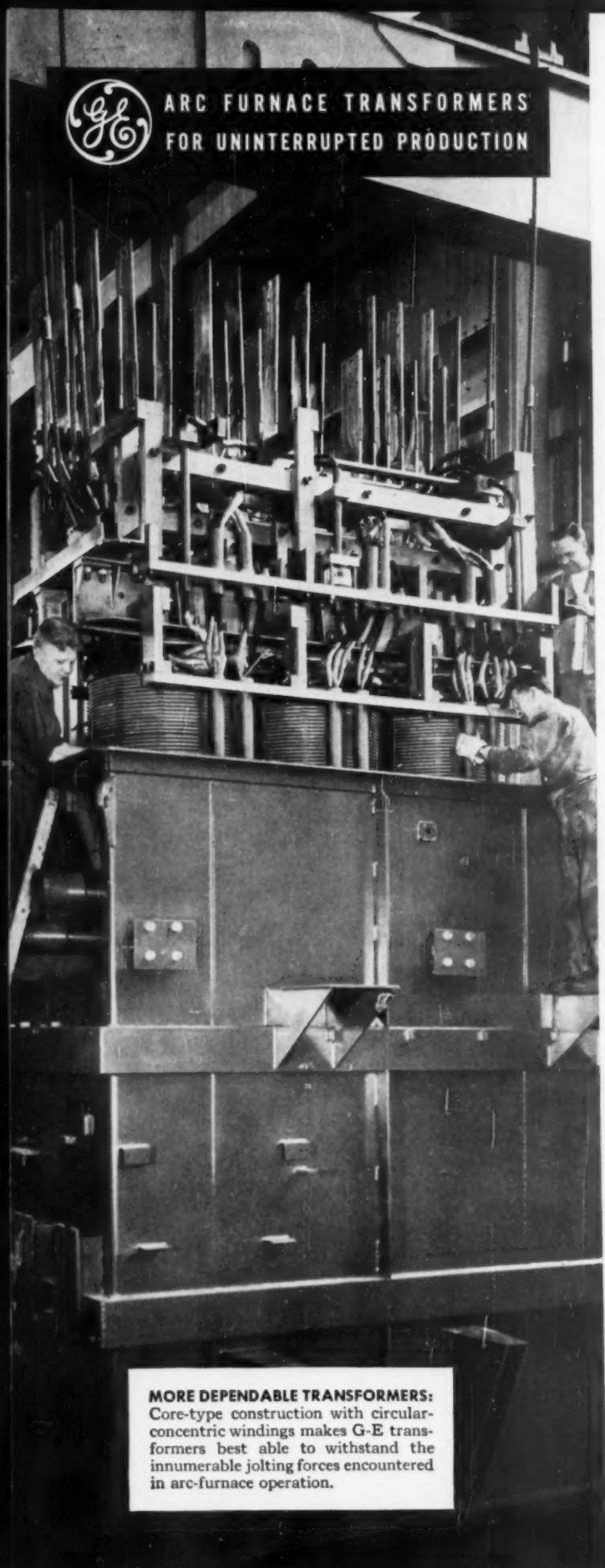
WHEELS of PROGRESS



MORE DEPENDABLE TRANSFORMERS: Core-type construction with circular-concentric windings makes G-E transformers best able to withstand the innumerable jolting forces encountered in arc-furnace operation.

G-E transformers keep your furnaces on the job

HERE'S WHY:

TREMENDOUS AND FREQUENT current surges during the meltdown period subject the windings and core clamps of furnace transformers to severe pounding stresses found in no other transformer application. The low-voltage bar-lead structure may also be subjected to forces more than 1000 times those encountered in normal power-transformer operation. General Electric Arc-Furnace Transformers are designed and built especially for this rugged service.

INHERENTLY STRONGER. Circular-concentric windings, used in all G-E transformers, are inherently stronger than other designs. A circular coil is far better able to withstand radial stress (the kind imposed by current surges), than a coil of any other shape. These coils are kept in place by a sturdy clamping structure, to prevent any shifting or deformation which could lead to failure.

GREATER STRENGTH is only one of many reasons why you should specify G-E transformers for your next arc-furnace installation. Others include: better cooling for more accurate control of hotspots, and a superior tap changer which has proved itself by a record of no contact-tip failures in over eighteen years.

For the full story, contact your nearest G-E Apparatus Sales Office or write to General Electric Company, Section 422-28, Schenectady 5, N. Y.

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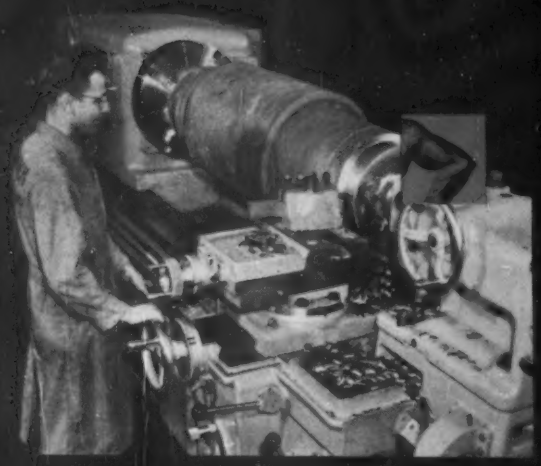
GENERAL ELECTRIC

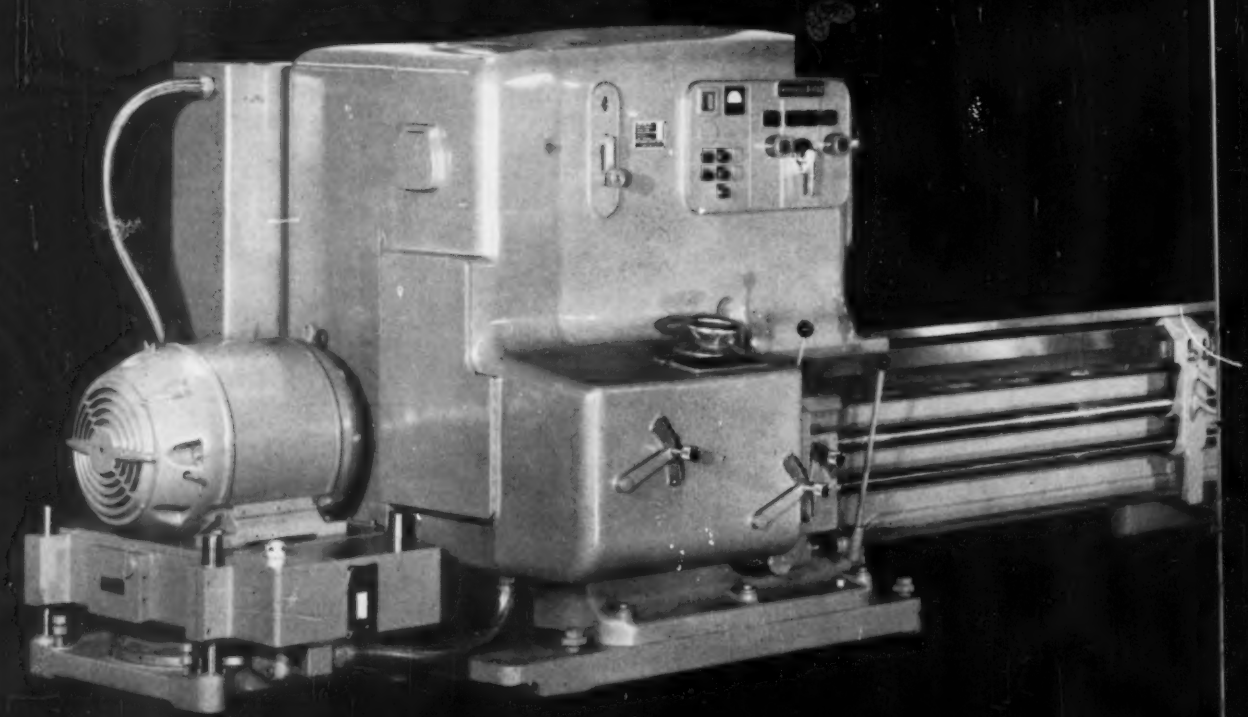
BRAWN

BRAINS



The MONARCH SERIES 90 DYNA-SHIFT HEAVY-DUTY LATHE – Model 2500: Clearance diameter —40″ . . . Swing over cross slide 25″. **Model 2501:** Clearance diameter—44″ . . . Swing over cross slide 31″. **Model 2502:** Clearance diameter—48″ . . . Swing over cross slide 36″.

When progressing from diameter to diameter, speed is changed in a few seconds with the flick of *one* dial. The *machine* calculates each speed and changes speed automatically. And the wide available range assures selection of the *right* speed for the diameter to be turned.



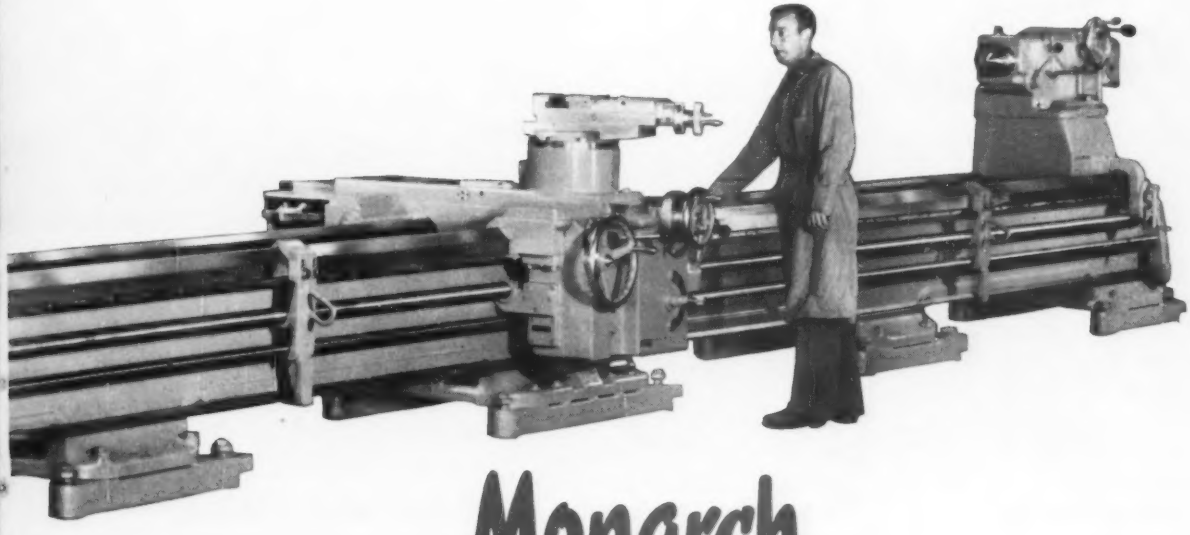
. . The Monarch Heavy-Duty Dyna-Shift

In a class by itself! Just set the work diameter indicator. In a flash, the exclusive Dyna-Shift drive headstock calculates and delivers the ideal spindle speed (36, from 6 to 750 RPM).

You get strength and power to match the brains. The equivalent of 60 H.P. gives this lathe the power to break and the speed to burn any carbide tool. And the massive design supports the heaviest of cuts.

Now, you can use carbide tooling to its ultimate advantage, with metal removal rates up to 120 cubic inches per minute, turning alloy steel. Always used at proper cutting speed, you get the ultimate in productiveness, maximum tool life, and close accuracy.

Here's a machine you've got to know about, and our twenty-four page illustrated booklet #1601 tells you in detail. Just ask . . . The Monarch Machine Tool Company, Sidney, Ohio.

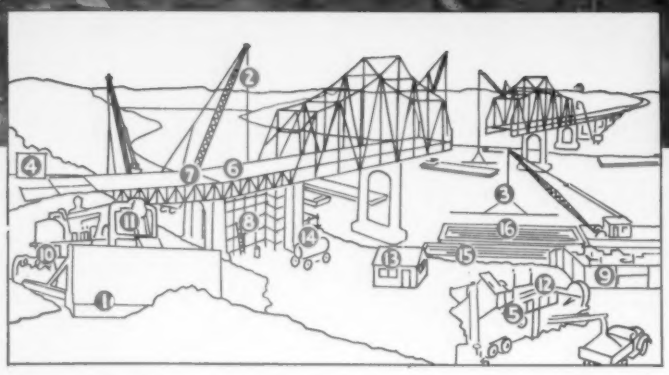


Monarch

TURNING MACHINES

ACCURACY • ECONOMY • LONG LIFE

FOR A GOOD TURN FASTER . . . TURN TO MONARCH



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13. Gold Strand Insect Wire Screening
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15. Claymont Carbon & Alloy Steel Plates
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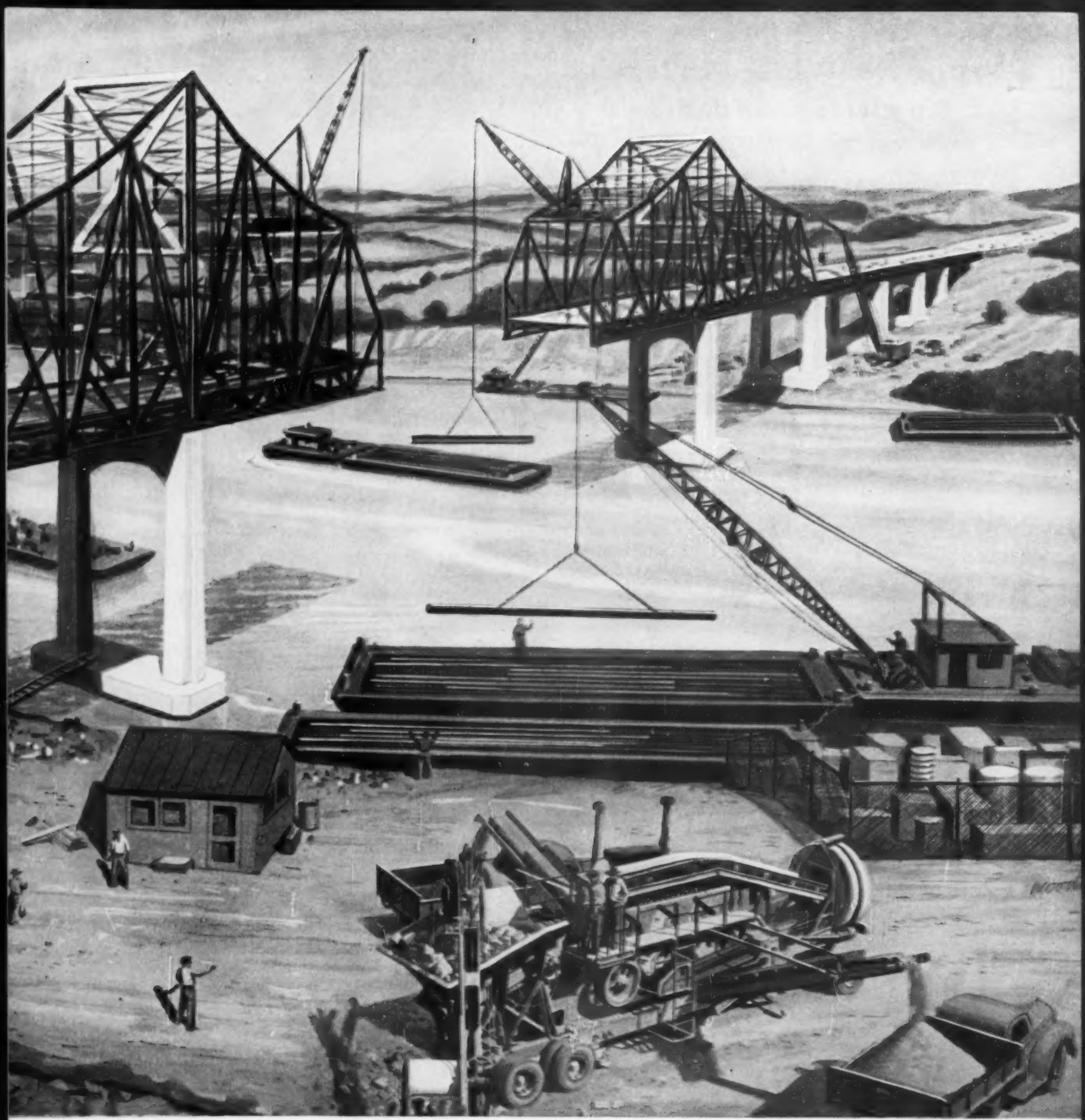

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SS-111

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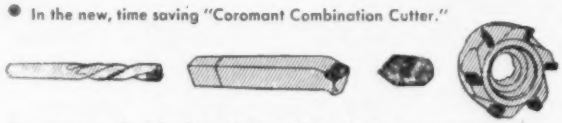
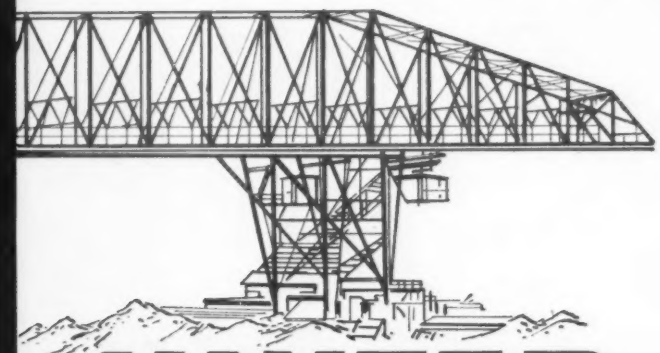
- In all standard grades with improved performance to suit a wide range of applications.
- Grades permanently color-identified on the end of tool shank and etched in the carbide blanks.
- In the new, time saving "Coromant Combination Cutter."

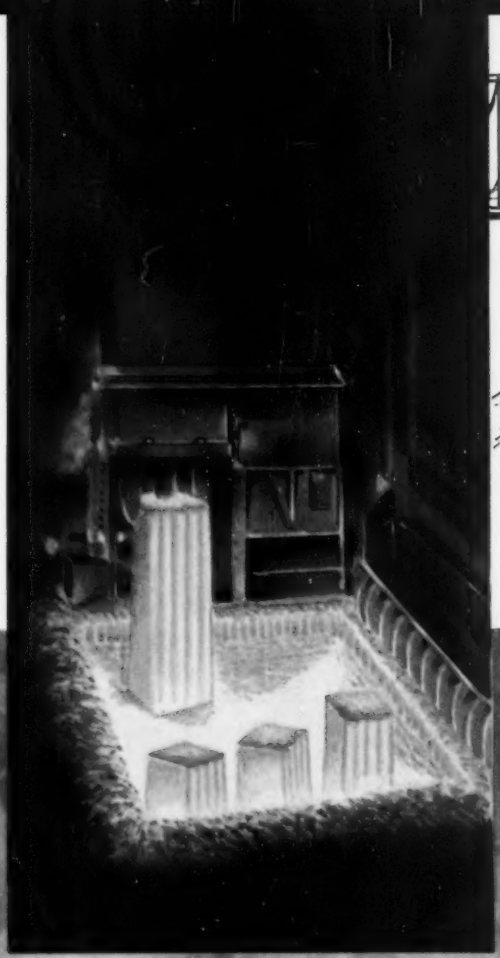


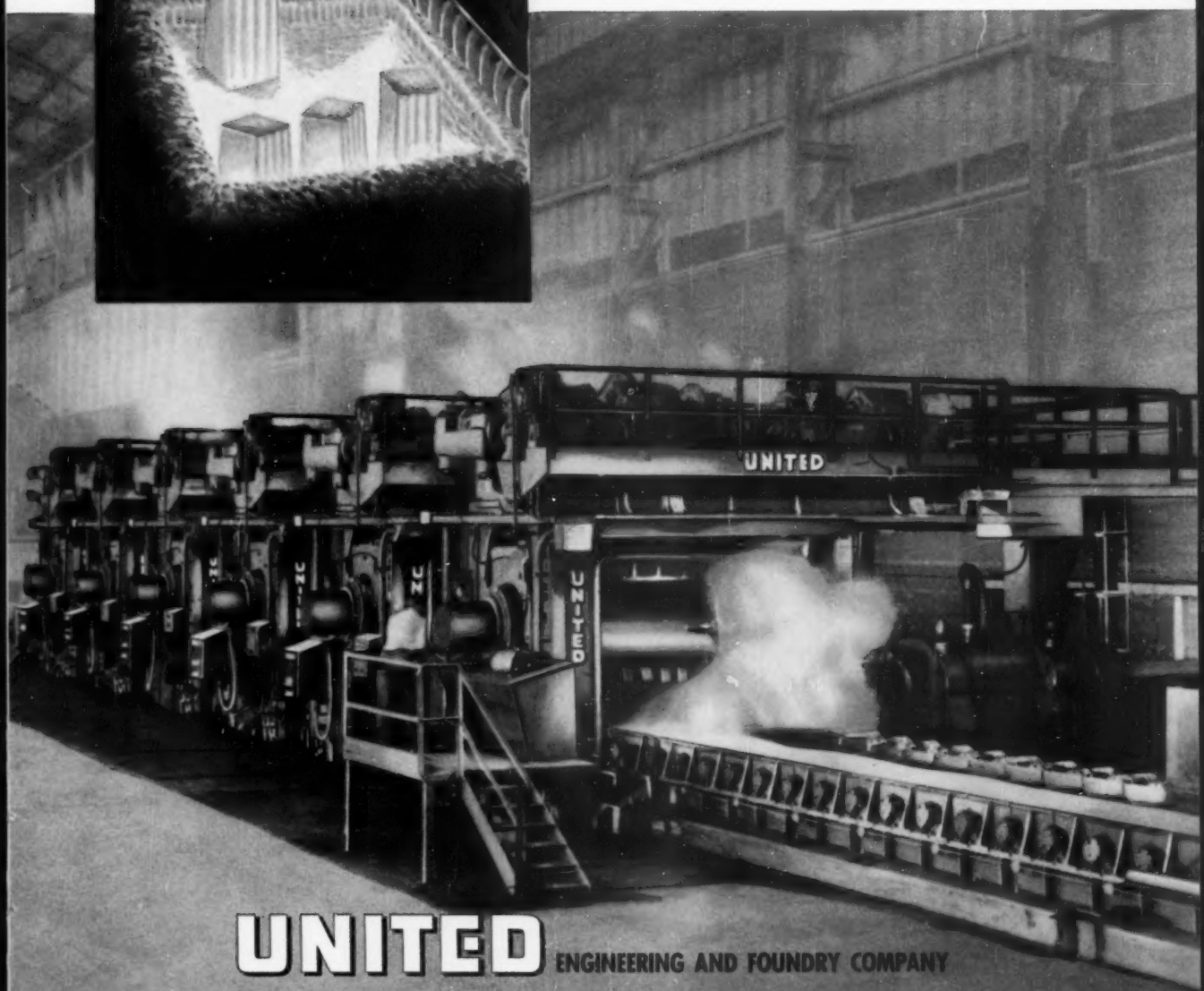
From ore to finished product within the same company.



UNITED®

6-STAND 4-HIGH HOT STRIP MILL





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PITTSBURGH, PENNSYLVANIA

Plants at Pittsburgh, Vandergrift, Youngstown, Canton, Wilmington (Lobdell United Division)

SUBSIDIARIES: Adamson United Company, Akron, Ohio
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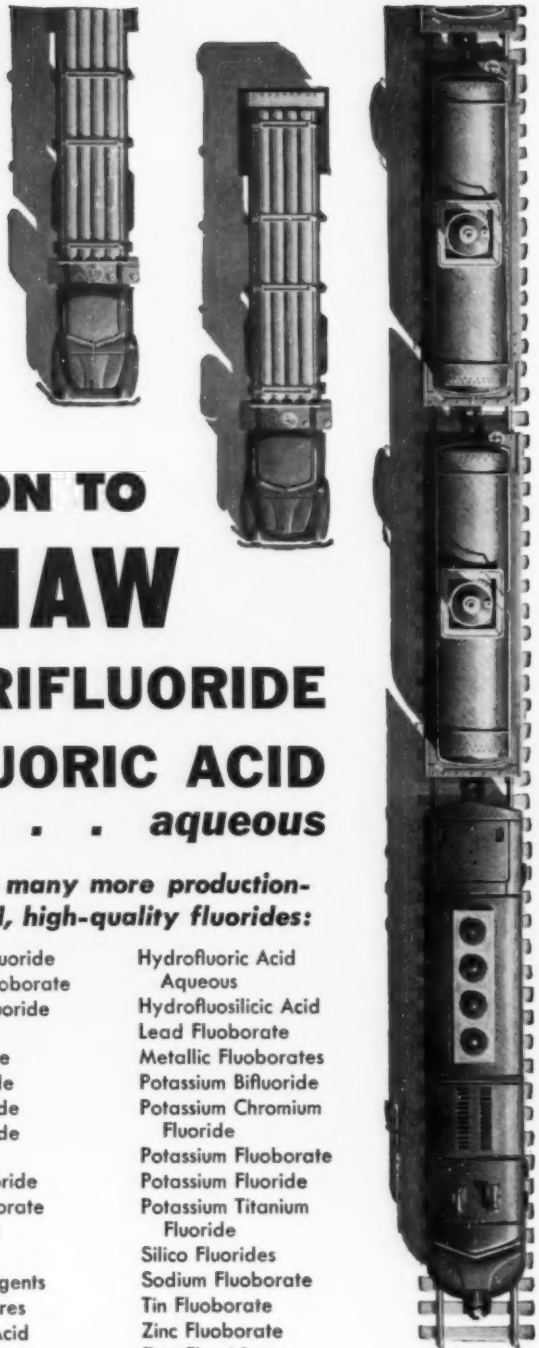

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Copper Fluoborate
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Frosting Mixtures
Hydrofluoric Acid Anhydrous
Hydrofluoric Acid Aqueous
Hydrofluosilicic Acid
Lead Fluoborate
Metallic Fluoborates
Potassium Bifluoride
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Harshaw's 40-page Book on Hydrofluoric Acid Anhydrous. It provides helpful data.

JEFFREY puts pig casting on a profitable basis

25-pound lead pigs are cast continuously and automatically ejected by this Jeffrey machine.

Jeffrey pig casting machines put this operation on a straight line basis, automatically emptying the molds after the metal has solidified. Production proceeds at a constant, rapid rate requiring a minimum of labor.

Aluminum, magnesium, lead and brass are among the metals being cast in Jeffrey pig casting machines. Designed to meet each company's exact requirements, they assure that this operation is most profitable.

For help on this or any foundry problem, Jeffrey engineers will assist you in selecting equipment for most efficient performance. The Jeffrey Manufacturing Company, Columbus 16, Ohio.

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He Saves Eyes and Dollars By Preventing Accidents Like This

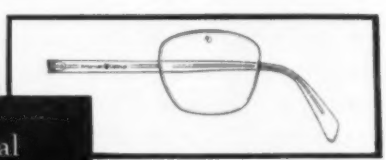
...He's A Safety Director!

Industrial eye accidents are costly — to *all* concerned. About 80,000 happen annually. In a recent case a carpenter lost the sight of his left eye when struck in the eye by an iron pipe on the job. He was awarded $3,562.50.

Accident prevention is a specialized business — and it belongs in the hands of a specialist — the Safety Director. He can prevent 98 per cent* of accidents like this when he has the full backing of management. He knows which rules work. He knows *quality* protective equipment and how it pays off.

In uninterrupted production, lower insurance costs and high plant morale he can *make money for you* as surely as a top administrator or salesman.

*According to the Society for the Prevention of Blindness 98% of eye accidents are preventable when workers wear safety glasses. Ask your AO† Safety Representative to call with case histories on the savings that have been made in *your* industry.



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Always insist on the AO trademark on safety lenses and frames.

†T.M. REG. BY AMERICAN OPTICAL COMPANY

SOUTHBRIDGE, MASSACHUSETTS • BRANCHES IN PRINCIPAL CITIES

Brush wire, crimped (as shown) or straight, now produced in multiple strand, and furnished in coils or straight hanks depending on wire size.

How a **new idea in wire** *cleaned up a brush production problem*

● Maybe you can profit by the kind of interest and action applied to customers' problems by the Worcester Wire Works Division of National-Standard. Take wire brush manufacture for example . . .

Until recently, brush manufacturers had to cut through a coil of wire, then gather by hand and by guesswork the approximate number of wires for the type of brush in production. Naturally this involved a lot of cut-off waste, plus the wire lost through faulty guesswork.

Now, to overcome this waste, Worcester Wire Works has developed ways to produce and furnish wire in predetermined bunches (up to 400 wires per bunch) with *exactly* the right number of wires for a given brush. Much costly loss is eliminated, more brushes are produced per pound of wire, and production is speeded.

The point is, Worcester Wire Works people specialize in more than quality wire. They also specialize in the kind of service and exploration that time and again cuts costs for customers. Better check with them on your wire needs. You'll like the way they do business.

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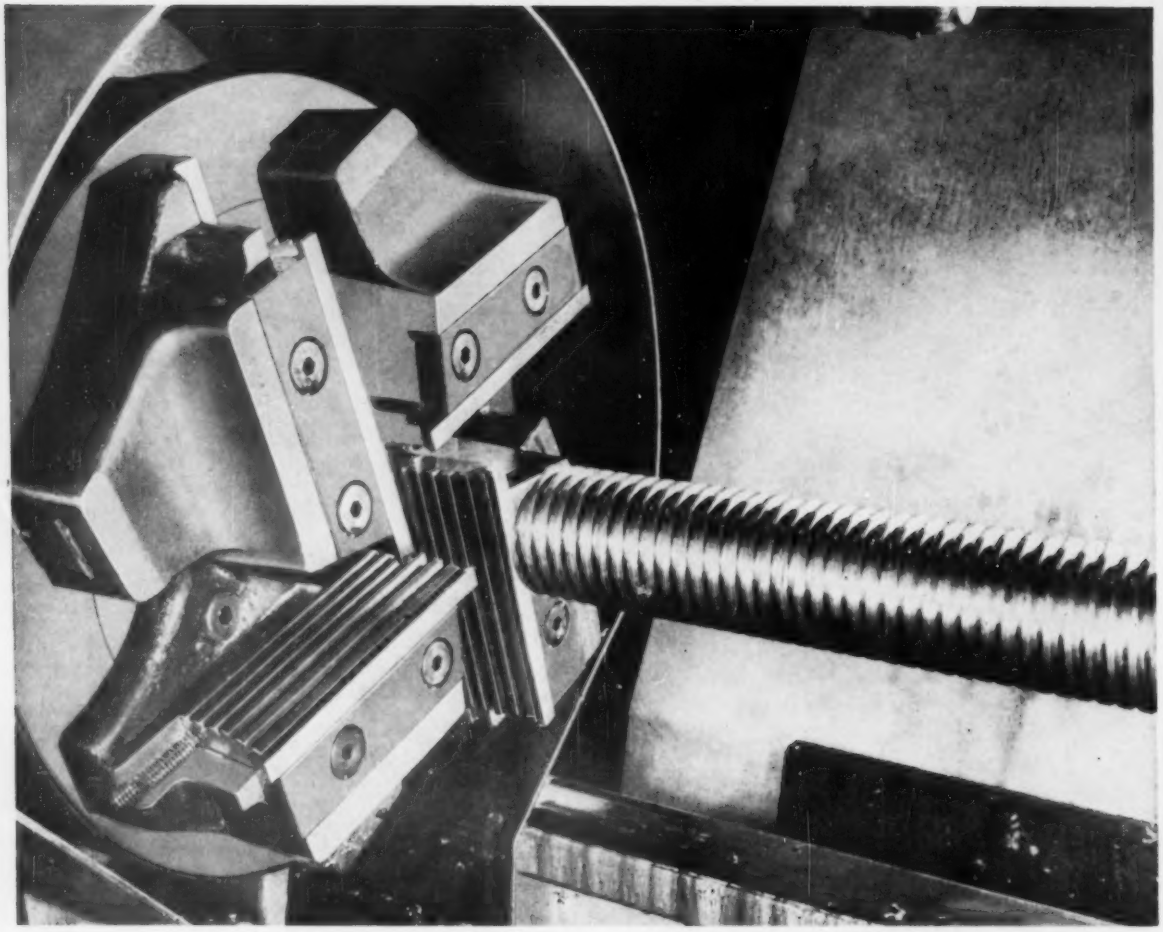
WORCESTER WIRE WORKS DIVISION • WORCESTER, MASS.
Round and Shaped Steel Wire, Small Sizes



90% threading time saved on power screws

This large saving in the production of power screws at Rodney Hunt Machine Co. (Orange, Mass.) was made possible by the use of a LANDMACO Threading Machine.

Specifications require 2¾" diameter—2½ pitch Acme threads 56" long on cold-rolled steel. 5 hours had previously been required to complete the thread. Floor-to-floor threading time was cut to only 30 minutes after the installation of a LANDMACO 32C Single-Spindle Machine with a special 60" carriage travel.

Many features in the design of this equipment make it possible to do heavy duty threading to precision tolerances. Heavy construction and leadscrew feed assure accurate threading. Slippage of the work is prevented by an improved carriage front with 60% greater gripping power.

Massive construction of the 4" LANCO head and chaser-holders give maximum support to the chasers for the largest or smallest diameters. The tangential design of the chasers provides lateral absorption of cutting strains and free cutting action. Their roughing-and-finishing form assures threads of excellent finish in one pass, and the centering throats eliminate the out-of-roundness common in long workpieces.

This is but one example of the production economies to be derived from using LANDIS Equipment on large diameter threading. For additional information, please send specifications and ask for Bulletin #*H-45.*

412

LANDIS *Machine* COMPANY

WAYNESBORO · PENNSYLVANIA · U.S.A.

Roebling drum packs are shipped on pallets unless otherwise specified. This gives you today's easiest, least expensive method of moving and stacking wire — with a fork truck, one man can do the work of ten.

Packed to save you money!

IN ADDITION to producing top quality high carbon wire, Roebling has developed many special methods of packing ...and some *one* of these, or some other method which may be developed for your specific requirements, may save a considerable amount of time and money in your plant.

Certain types of wire, for instance, can be packed in hexagonal fibre drum packs that provide superior protection and facilitate handling and storing wire. Drum packs do not have to be returned... save you bother, storage space and freight charges.

You *pay* for the best when you buy high carbon wire. Make sure you *get* the best, in wire and packing too. Always specify Roebling. John A. Roebling's Sons Corporation, Trenton 2, N. J.

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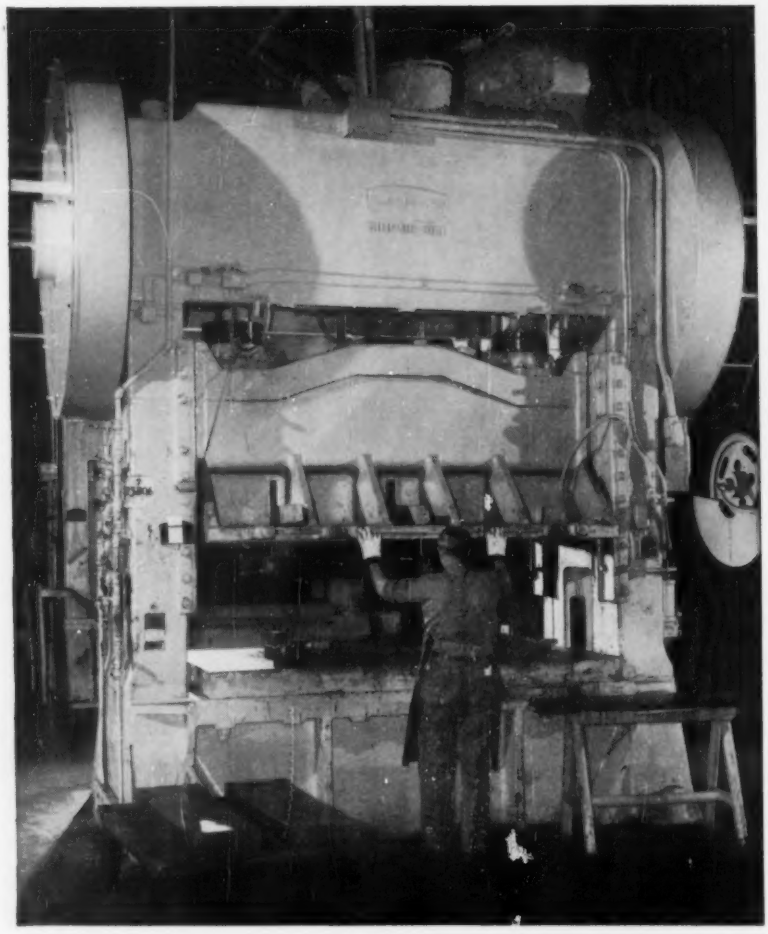
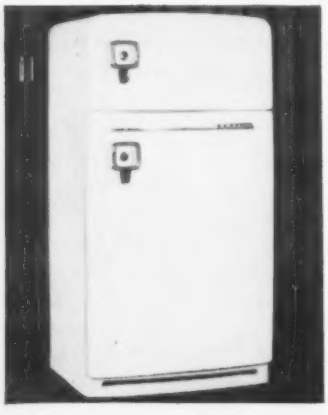
If you wish, Roebling spools will be delivered on pallets with separators, providing the easiest and most economical means of handling and stacking wire with fork trucks.



The Cleveland Double-Crank Press shown here draws more than seven parts for the famous Servel Refrigerator.

SERVEL, INC. finds Cleveland Presses

"require very little maintenance . . . have no clutch problems"



Installed in the Home Appliance Division of SERVEL, INC., Evansville, Indiana, in March of 1951, the Cleveland Double Crank Press you see here has been constantly "on the job" producing parts for famous Servel refrigerators.

Carl Linke, Foreman of the Sheet Metal Department, says, "This Cleveland 80D is a good press. We've used it for most of our draw work for the past five years. During this time it has required very little maintenance. We've had no clutch maintenance problems."

As have many of the nation's leading stamping departments, you, too, will find that Cleveland Presses prove themselves to be easy-to-maintain, low-cost producers. Before buying your next press be sure you have the complete Cleveland story. One of the 11 specialized types of Cleveland Presses is sure to be your answer to greater stamping economy. Write or call today!

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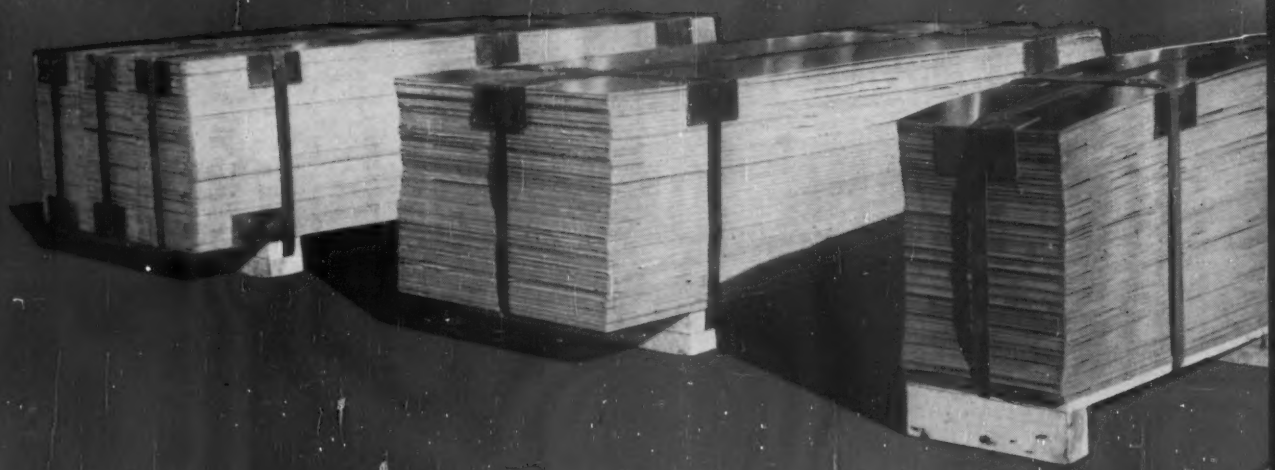

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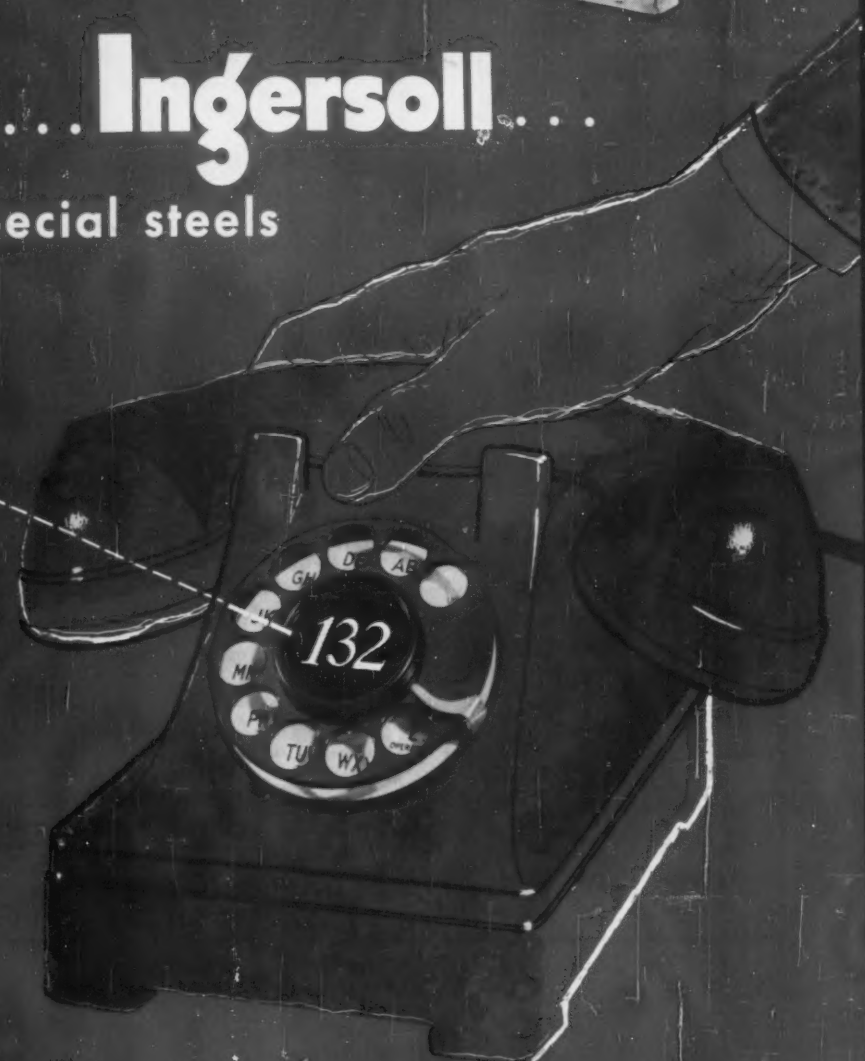

Ingersoll
STEEL DIVISION

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*BORG-WARNER TRADE MARK

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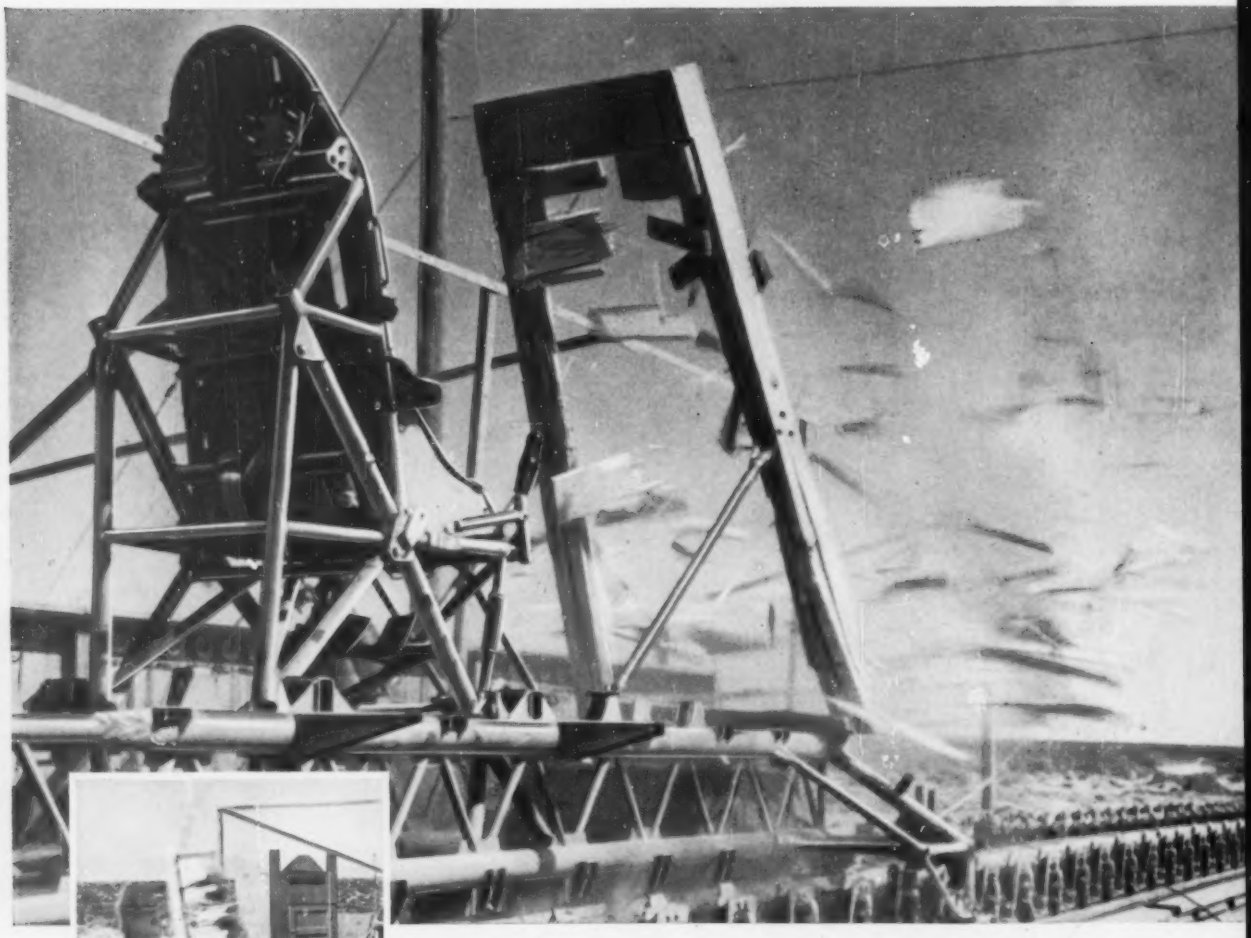
Pound for Pound, Tubular



(above) The safety belt was purposely not fastened in this rocket sled test checking the force of man's momentum. As sled decelerated suddenly from high speed, "Oscar" the dummy, crashed through the wooden panel and disappeared momentarily in a blur of dust and debris. He struck the barrier at an estimated 130 mph, came to rest 700 feet up the track. Inset (left) shows moment of impact. This 7-foot-high sled was fabricated entirely from tubing to obtain maximum strength per pound.

REPUBLIC

REPUBLIC STEEL

World's Widest Range of Standard Steels

Construction is STRONGEST!

Where strength is an important requirement—such as this rocket sled application (left) for deceleration tests—manufacturers choose tubing for basic construction. They know that at any given weight, tubing is strongest of all mechanical shapes . . . as a beam . . . in torsion . . . under compressive loads.

And through many years of good experience, structural fabricators know that—dollar for dollar—Republic ELECTRUNITE® Steel Mechanical Tubing is their best buy. The original electric resistance welded tube, ELECTRUNITE is well-known for both quality and performance. It's available in a wide variety of sizes, gages, and shapes . . . in both carbon and stainless steel.

Predictable characteristics are assured because ELECTRUNITE tubing is made of Republic steel, to rigid Republic standards—each step carefully controlled from ore to finished product. Though produced in great volume, every length is consistently uniform, foot to foot, shipment to shipment. Wall thickness is uniform and so is concentricity. Surfaces are free from scratches and pit marks. It offers uniform response to heat treatment. It is easy to fabricate . . . often eliminates some costly fabricating or machining operation.

If you have a product that must be strong, safe and lightweight, investigate Republic ELECTRUNITE Steel Tubing. Republic's engineers can help you design it into your products or processes—economically and profitably.

Mail coupon below for all facts.

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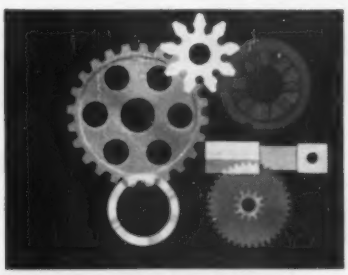
LIGHTWEIGHT ARMOR OF STAINLESS STEEL makes it possible for the Fruehauf Trailer Company's shiny new Volume Van to move a 35% bigger pay load. Stainless steel's exceptionally high strength-to-weight ratio permits the use of thinner, lighter sections—without loss of strength or sacrifice in safety. And where corrosion-resistance is important, stainless steel is ideal. We are glad to offer the services of our metallurgical and engineering departments. Contact nearest Republic office.



SMALL PARTS CAN OFTEN BE MADE FASTER, MORE UNIFORM—and at less cost using Republic Iron Powder. Complicated shapes, difficult to produce economically by conventional means, are easy to make by this new method. Republic metallurgists and engineers, with a thorough knowledge of all types of metals, can help you determine iron powder's suitability to your parts production. This service is available without cost or obligation. Just mail coupon.

WITHSTANDING ENORMOUS STRESSES AND STRAINS are all in a day's work for the track pins and dead axle shaft on this giant Oliver "OC-18" Industrial Crawler Tractor. Republic Cold Finished Steels at these vital points absorb tremendous punishment—yet continue to provide unfailing service. In countless other industrial applications, Republic Cold Finished Steels can give you the performance you want. Contact your local Republic Office or mail coupon for facts.

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ALLIS-CHALMERS
MOTORS

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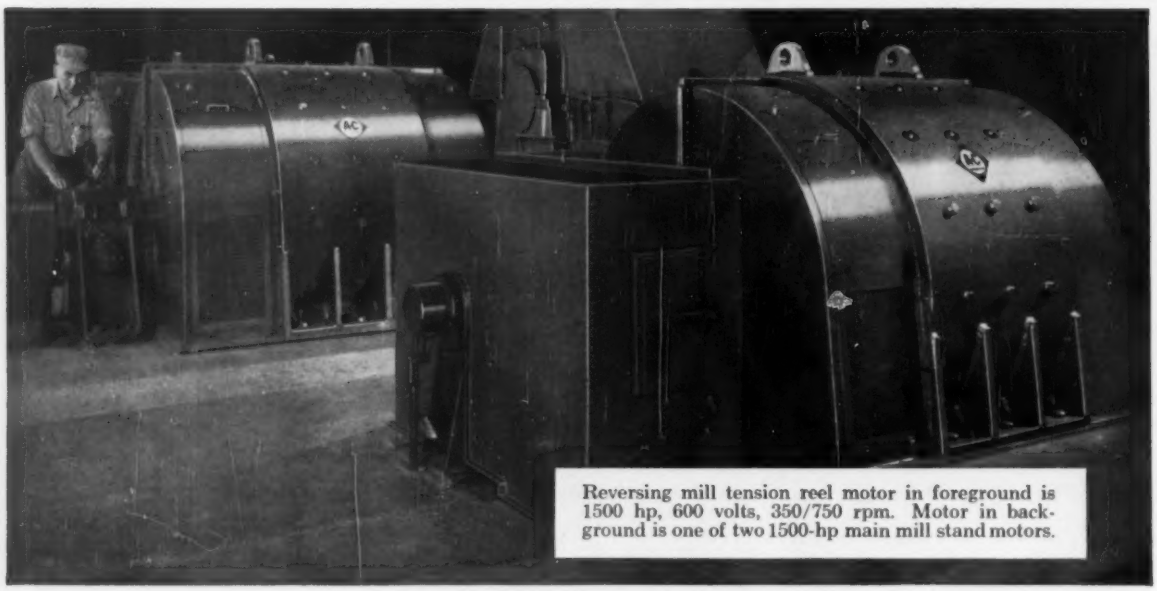
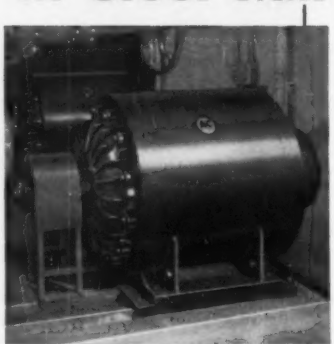


Reversing mill tension reel motor in foreground is 1500 hp, 600 volts, 350/750 rpm. Motor in background is one of two 1500-hp main mill stand motors.

Dependable Allis-Chalmers Motors Play Key Role in Steel Mill Expansion

Expansion recently completed in an eastern steel mill included two new processing lines and a new reversing mill. Allis-Chalmers application-engineered motors furnish dependable, economical drive power for these new specialized steel facilities — helping this major producer attain top steel yield.

For experienced help with *your* expansion or modernization plans, contact your local Allis-Chalmers office or write Allis-Chalmers, Power Equipment Division, Milwaukee 1, Wisconsin.



Here are Allis-Chalmers 100-hp, tube-type, TEFC explosion-proof cage motors driving pumps in oil room below the reversing mill.

NOW, you get even more winding protection with SILCO-FLEX

all-silicone-rubber motor insulation, available only on Allis-Chalmers motors — in many of the larger sizes. Ask your A-C representative for the facts about this revolutionary new insulation system.

Silco-Flex is an Allis-Chalmers trademark.

ALLIS-CHALMERS

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NEWSFRONT

What's Fate Of Fast Tax Writeoffs?

Will tubular goods, structurals and plate capacity get fast tax writeoff help for expansion? Office of Defense Mobilization is currently sitting on a Commerce Dept. study, made at ODM request, which holds the answer. ODM's expected to sit tight, not release recommendations until next month. Considerable pressure's been built up for reopening of steel expansion goals and fast tax privileges.

Less Bang For The Buck

Brace for another boost in defense spending, thanks to inflation. The Pentagon figures hiked steel price boosts alone will send costs climbing as much as an extra $35 million. Machine tools, aluminum prices are rising and defense contractors are passing on to Uncle Sam their higher wage costs. Result is that Congress may have to appropriate nearly $1 billion more next year merely to maintain defense at its present strength level.

Sulphur Avoidance Made Easy

Simplest way to avoid extra sulphur pickup in basic openhearth operations is to choose a fuel with an extremely low sulphur content. Sulphur in fuel oils is fed to both the melt and the slag during the entire melting period, according to a recently-completed steel plant research program. Relationship between fuel oil sulphur content and pickup in the average heat? Almost linear, the studies showed.

Oilfields Feeling Strike Losses

Steel strike losses will hit hard at planned oil well drilling this year. Shortages of oil country goods will drop new well drilling from an estimated 55,000 wells to about 50,000. Oil and gas demand for steel was tight even before the strike began.

Piggy-Back Presses Speed Production

What's good production-line layout for high volume contract producers? One New England plant achieves chameleon-like flexibility by "banking" punch presses between setups, then lugging around with forklifts to make up most efficient layouts for particular jobs. All 150 presses are fitted with movable machinery mounts with built-in levelers. Result, largely of this move: labor costs are down 20 pct.

Battery-Like Fuel Cell Under Study

A new "fuel cell" battery obtains its energy entirely from gases such as oxygen and hydrogen. Researchers say that, instead of conventional battery materials, cells might consist of layers of porous carbon and a liquid paste caustic solution with space between. Gases introduced would react to produce either positively- or negatively-charged particles.

Squeeze Helium Out Of Sponge Production

Bureau of Mines reports that high-purity argon (which is plentiful) can substitute satisfactorily for helium in certain steps in titanium production. Specifically, in reducing titanium tetrachloride with magnesium. This is done, researchers report, without sacrifice in quality of resulting sponge and with only minor change in the reduction technique.

Atom-Driven Carrier—When?

First atom-driven aircraft carrier may join the fleet by 1961. That's the schedule planned by Navy strategists for getting approval from Defense Secretary Wilson this fall; requesting Congressional authority and funds in '57 for building the carrier. Congress voted $30 million this year for first reactor of type needed to run it. A 60,000 hp atomic carrier may require up to six such reactors.

Plenty Of Sponge Around

Titanium sponge production is running well ahead of consumption in the U. S. Government figures show production totaled 8800 tons for the year ended last June, while imports of over 900 tons swelled the total. Consumption for the period was 6600 tons. Most surplus goes into Government inventory.

How to make your automatic heat-treating and hardening even more automatic ...at no extra cost

FAST, continuous operation is the key to profitable automatic forging production lines. Especially in high speed heat-treating and hardening operations. They're extremely sensitive to changes in chemical composition and structure of steel used. Interruptions to make tests or adjustments slow production, increase costs, reduce the advantages of automatic operation. This makes the uniformity of the steel you use an even more vital factor. The more uniform the steel, the steadier the production and the greater the potential you can realize from your automatic equipment.

You can get the utmost in uniformity, and automatic operation—at no extra cost—by using Timken® fine alloy steel. Uniformity is constant from bar to bar, heat to heat, order to order.

We take many extra quality-control steps to assure this uniformity. For example, the Timken Company uses a magnetic stirrer for molten steel to assure equal distribution of alloys, uniform temperature and improved working of the slag. It's the first installation of its type in the United States.

To further assure uniformity, your order of Timken fine alloy steel is handled individually. We target our conditioning procedures to meet your end use requirements. Each bar is stamped to identify the heat it came from. This limits variations within an order as well as from order to order. And every heat is examined spectrometrically to insure uniform grain size.

To make your automatic heat-treating and hardening operations even *more* automatic—at no extra cost—always specify Timken fine alloy steel. You'll get money-saving performance and uniform results every time. The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

TIMKEN *Fine Alloy* **STEEL**

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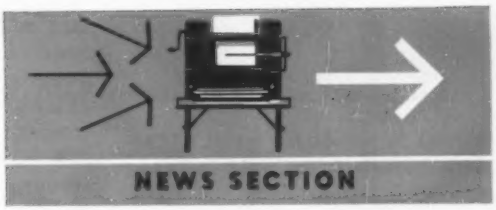
SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS STEEL TUBING



Short Term Loans Will Be Hard To Get

Seasonal business borrowing runs into tight money market . . . FRB hikes discount rate to cut fringe capital borrowing . . . Short term loans will be tight for at least 60 days . . . Some easing seen later.

◆ WHEN THE Federal Reserve Board raised its discount rate from 2.75 pct to a flat 3 pct in most FRB districts, it put the finishing touch on a week of interest hiking all across the financial front.

It followed on the heels of a raising by banks of the "prime" interest rate (the interest rate charged the biggest borrowers with the best credit ratings) from 3.75 to 4 pct, and other increases in interest rates for virtually all types of borrowing.

Hard to Get

All of these financial developments underlined the tightness of the money market in general and the growing cost of borrowing money. It has reached the point where it is difficult to obtain money at all, regardless of ability or willingness to pay the higher rates.

Although major emphasis is on money for capital expenditures, the tightening of the money market extends to home building, consumer credit, and to short term loans. These are particularly important at this time of the year when businesses of all sizes are seeking short term financing for purchases of materials or component parts to build inventories for the late 1956 and early 1957 seasonal production surge.

Although financial circles had expected an easing in demand for loans in the third quarter, the upswing started earlier than expected, tightening the market more than anticipated. Furthermore, fourth quarter loans will be even tougher to get.

Financial spokesmen have been confident that seasonal credit demands would be met. They explain that the real cause of tight money is the demand from corporations seeking capital funds for equipment expenditures, new plants, and other capital investments.

Seasonal Demands

But many a small businessman is quick to disagree. Frequently he finds his normal borrowing source without available cash, has to go to commercial loan houses. And even there, it isn't always easy to get needed funds.

What has happened is that demand for capital funds has exceeded the normal capital market and extended to funds normally available for short term and seasonal financing.

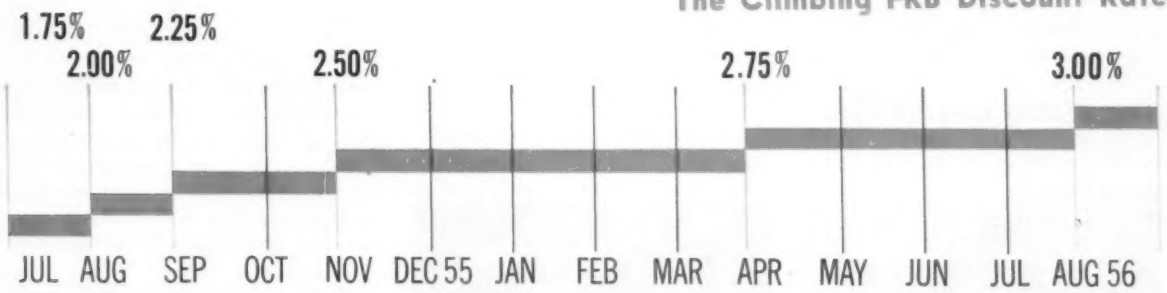
It's possible, then, that tightening the market for capital money could cut the rate of borrowing for capital expenditures, making more money available for short term customers. Should this occur, there could be some easing in short term funds later this year.

Real Inflation Danger

Washington financial sources predict that short term money will be tight and even tighter for at least the next 60 days. After that, some measures may be taken to ease the market. What measures would be taken are not immediately clear. It is doubtful if the discount rate would be lowered, however.

Raising the discount rate (the rate charged by the Federal Reserve system on loans to member

The Climbing FRB Discount Rate



banks) is the direct result of the FED's real concern over the danger of inflation. It is the sixth such increase approved by the FED since April, 1955, when the rate was 1.75 pct.

By making borrowing more expensive, the Board seeks to discourage fringe borrowing that could lead to higher costs and even greater demand for funds. The Board emphasizes, however, that it does not intend to dry up the sources of credit for legitimate, seasonal needs of business.

Not Unanimous

But the Board's actions and theory of minimizing the danger of inflation by increasing the cost of borrowing are not universally approved by business—or even in Washington. Treasury Secretary George Humphrey and Commerce Secretary Sinclair Weeks are both known to oppose the move.

They, and other opponents of that method of keeping inflation under control, believe that making money more difficult to obtain, and at a higher cost, is not the way to combat inflationary forces.

In most cases in the expanding economy, the businessman who goes to the banks for money actually needs it—whether for capital expenditures or short term financing of needed inventory. Increased costs of money, without increasing the supply of money available, will only be passed on to the consumer as any other increased cost of doing business, whether it's labor, materials or financing.

See Editorial

"Is The FRB a Sacred Cow?"

Page 7

Indirect Method

On the other hand, the action represents a marked difference in policy between Republicans and Democrats on means and methods of combatting inflation. Democrats resorted to direct methods of controls, such as price controls and the like. Republicans, on the other hand, are attempting to use indirect controls of stimulating or, as in this case, slowing up the flow of money.

Meanwhile, a scramble for available funds for short term financing is shaping up.

Inquiries Up

In Chicago, for example, a number of small loan companies report that total inquiries from small business received in July and August, normally the slowest season of the year, were at a higher rate than the normal seasonal high months of the first half.

The loan companies themselves, particularly smaller companies with smaller reserves, have already been hard hit by the heavy borrowing in the first half of 1956. They are finding it difficult to extend their lines of credit with their own sources of cash: insurance companies, banks and institutions.

No Easy Way Out

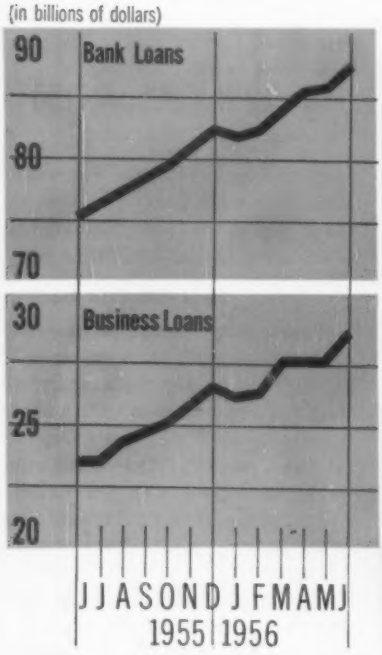
The small banks which often extend short loans to small businessmen were actually running out of loan cash as early as late 1955. Some businesses exhausted their normal sources then or early this year, now find difficulty in floating fresh loans from commercial houses.

With a normal tightening of credit in October and November, fourth quarter could be a difficult period for the firm needing cash and needing it right away.

What can be done about it? Not very much. The money just isn't there. But with banks and other sources able to pick and choose, a potential borrower will have better luck by making his loan request as attractive as possible.

Meanwhile, many a small businessman is hard pressed for cash and finds the FED's hard money policy of small consolation. He needs the money for his inventory for the coming months and, although he may not be happy to do it, will probably pay 5½ to 6 pct interest to get it.

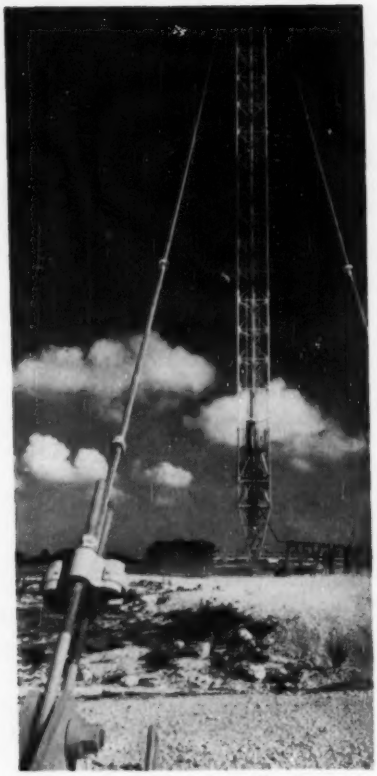
The Rising Credit Tide



Source: Federal Reserve Board

TOWERS: Microwaves To Rescue

Advantages of microwave signals perk up market for steel relay towers . . . Impulses traveling in straight line, require more, higher towers—By G. J. McManus.



Blaw-Knox photo

◆ COMMUNICATIONS TOWERS are riding the microwaves to new heights, in terms of both sales and size. Steel towers for video signal transmission marched across the country with the spread of TV. They were just approaching the end of this road when microwave transmission took hold. Now a new string of towers is going up.

Microwaves are high frequency impulses that can be aimed from spot to spot, like a searchlight beam. They don't pick up static; they need little transmitting power; they make efficient use of frequencies (which are in demand). For these and other reasons, microwaves prove an excellent substitute for cable in long distance telephone and television systems.

Steel Market

Beauty of this development, for tower makers, is that microwaves travel in a straight line. Elevated towers are needed at regular intervals to relay signals. Bell Telephone has installed 569 relay towers, spaced 30 miles apart, ranging in height from 40 ft to 250 ft. Fifty-seven are concrete; the rest steel. This system has replaced a good part of Bell's long distance telephone line and 70 pct of the coaxial cable for its TV network.

Utilities, oil companies, and others are making more use of microwave systems for communications and control. Westinghouse Electric Corp., which offers a "turnkey" microwave package, has sold systems to Standard Oil Co. of Indiana (eight steel towers); the city of Austin, Tex. ($750,000); and the Air Force ($2 million).

Voice and telegraph messages can go by microwave. Because of the broad band width, 30 separate voice messages or 450 telegraph channels can be sent at the same time.

These industrial applications, while offering an interesting potential, have so far required only a relatively small number of light towers. There is nothing small, however, about the potential defense market for microwave towers. Microwave could prove even more important than radar to the tower makers.

Outlook

The $2 billion SAGE project, which AT&T is putting into operation for the Air Force, is believed to center around microwave communications. Linking 8 combat and 32 direction centers, SAGE will provide high speed coordination of spotter information.

Regarding the outlook for all communications towers, Blaw-Knox Co. of Pittsburgh is optimistic. Pioneers in the field, Blaw-Knox was building radio transmission towers back in 1926 and radar installation in 1938.

When it appeared that the demand for AM radio towers had been met, FM came along and opened up a new field. Following this, television transmitters moved in to take up the inevitable slack. Now microwave is moving up.

Custom Tailored

Current communications towers are custom tailored jobs. In the old days, Blaw-Knox had a standard price list for radio towers of different heights. Today's towers can be simple structures supported by guy wires. They can be self supporting frames, equipped with elevators and outsized pick-up devices. Or they can be enclosed buildings, jammed with equipment. Each situation requires its own special design. This creates production problems but it also makes new towers highly perishable from a technical standpoint.

The average tower is made of standard bridge structurals. Solid rounds are used as corner members of the higher towers and for the real skyscrapers, special steels have been used to advantage to keep down bulk.

Nothing But Tinplate

The American Can Co. will build the first plant devoted exclusively to the processing of tin plate, in Hammond, Ind. Project is expected to be completed and ready for production by early in the spring.

This is the first step in Canco's $27 million proposed expansion expenditures.

Company will receive plates in large coils and will perform processes formerly done by the steel companies.

MARKETING

SELLING WEST: Not As Simple As It Seems

Big question is whether it is cheaper to build in the West or ship from the East . . . Higher western material costs, cheaper water transportation make National Electric move back East.

◆ WEST COAST'S growing markets are raising a big question for Eastern companies. Is it better to build a plant on the Coast or to haul products westward?

One Pittsburgh firm has just decided against West Coast production. National Electric Products Corp. is closing its plant at Torrance, Calif. Makers of rigid steel conduits and electrical distribution products, National will build a warehouse in Los Angeles, for products which will come from plants at Ambridge, Pa. and Linden, N. J.

The company's outlook can't be taken as applicable to all situations but it does point up some of the factors to be considered in a move to the West.

Cost Factor

NEPC began production on the Coast in 1948. Since that time company sales in the area have about doubled. Despite the market growth indicated, the Torrance works is being closed. Why? Because National feels it can supply Coast points at less cost from Eastern plants than it could from Torrance.

One reason is material cost. To make electrical conduit, National buys seamless and buttweld pipe. Base price on 1½ in galvanized buttweld pipe is about $25 a ton less at Pittsburgh than on the West Coast.

On the other hand, the electronics industry has flourished since its big cost item is skilled labor. Raw materials are relatively unimportant coastwise. But for the average metalworking plant, material price differentials add substantially to West Coast production costs.

Another significant point for National was the savings gained from consolidated production. The Torrance plant has been making steel conduit and electrical metallic tubing. But only a small percentage of the company's total output came out of Torrance. This made for high cost, short production runs.

Duplication

Same reasoning has led other companies to discontinue duplicate facilities. Some years ago, General Electric concentrated appliance operations which had been scattered over the country, in Appliance Park, Louisville, Ky. Organizational considerations entered into GE's move but it was also part of a trend away from branch plants.

A third factor considered by National was transportation cost. In shipping to the West Coast, the company ordinarily takes the long way around. Ambridge products go by rail to the East Coast; coastal freighters carry them to West Coast ports. This method yields a saving of about $200 a carload over direct rail shipments to the same ports. It is a vital factor in enabling National's Ambridge plant to beat the delivered cost of Torrance products.

Long Way Around

Coastal freighters will pick up at any Eastern port and deliver to any Coast port. Rates are the same to either San Francisco, Los Angeles, or Seattle. Of course a company shipping by water to West Coast customers must allow plenty of lead time in scheduling deliveries. Right now there is a shortage of coastal shipping, so space must be booked well in advance.

Expansion Briefs

General Tire & Rubber Co., Chemical Div., Akron, O.; awarded contract to Luria Engineering Co., Bethlehem, Pa., for two steel buildings for the Ashtabula, O., polyvinyl chloride plant.

International Salt Co., Scranton, Pa.; adding 28,800 sq ft steel storage building to Retsof, N.Y., mine.

Boice Gages, Inc., Straatsburg, N. Y.; building a new plant at Hyde Park, N. Y.; expected to triple present production.

Wendnagel & Co., Chicago; structural steel fabricator; purchased 17 acres near O'Hare Field, expects to start developing the property by end of the year.

Clark Controller Co., Cleveland; established engineering and manufacturing facilities in Los Angeles.

Stanat Mfg. Co., Long Island City, N. Y.; designers and builders of metal processing equipment; building new plant in Westbury, L. I., N. Y.

Air Research & Development Command, U. S. Air Force; will construct multi-million dollar facility for testing of radar components at Rome, N. Y.

Pressure Pipe Co. of Canada, Ltd.; building new plant in metropolitan Toronto for production of concrete pipe; cost about $2 million.

William Brand & Co., Inc., Willimantic, Conn.; cable and wire manufacturer; addition of 33,000 sq ft to N. Windham plant; cost about $300,000.

ARMED FORCES: Too Few Tech Sergeants

Higher pay has helped reenlistments but the shortage of technical military personnel still is serious . . . Offers from industry are luring them away . . . Defense Department looks for answers—*By R. M. Stroupe.*

◆ KEEPING the military forces supplied with enough technical and professional men is proving a frustrating task for the Defense Department.

As the heavy brass at the Pentagon realizes, and as industry will attest, there are entirely too few engineers, technicians, and scientists in the U. S. to keep pace with civilian and military demands. In fact, there are too few of these specially skilled persons to satisfy the civilian economy alone.

Reenlistments Higher

Existence of the very limited pool of highly trained specialists has meant, generally, a marked tendency by these men to line up with private industry. The companies they join can outmatch the armed forces in starting pay, opportunities for increased responsibilities, and eventual security.

Defense Department executives readily see the movement of men with scarce specialties into civilian jobs and, with the aid of Congress, are attempting to counteract it. They have asked for and received better military pay, improved medical care for dependents, and a higher statutory ceiling on regular officer strength as stimulants to choosing a service career.

To some degree, the career incentive program shows results encouraging to the military. Carter L. Burgess, the Assistant Defense Secretary for manpower, discloses that in a two-year period ended last spring the regular reenlistment rate for all services climbed from 24 pct to 43 pct.

But this over-all rise in the rate is not constant throughout the military establishment. The Navy, points out Mr. Burgess, has a difficult time boosting reenlistments because its extended sea operations separate families for long stretches.

Big Budget Item

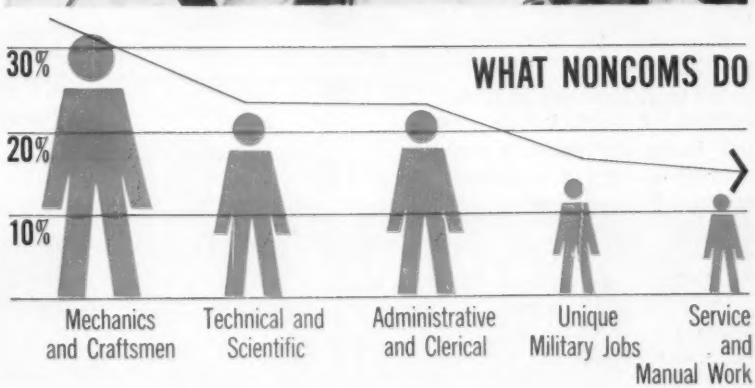
When men in any of the services sign up for another hitch, there's a strong chance that many critical-specialty spots will remain unfilled. Reenlistment rate for "first termers" who are communications specialists is only 20 pct, compared with 38 pct for security personnel such as military and air police.

The acute problem of sufficient skilled manpower is not confined to the areas where uniformed personnel alone are concerned. Military personnel activities are so vast that 45 pct of the national defense budget goes for persons on active duty, in the reserve, in civilian jobs, or retired from duty.

Seriousness of the trained worker situation led to creation this summer of a special defense advisory committee on professional and technical pay, headed by Ralph J. Cordiner, president of General Electric Co.

While waiting to see what proposals result from on-the-spot surveys made at military bases by the committee, Mr. Burgess makes a plea for toned-down advertising by firms seeking to hire servicemen.

MANPOWER IN ARMED FORCES



WELDING: A Bead On Record Sales

Growing popularity of high-speed welding equipment is setting pace for 1956 . . . Improved structural technique and stainless steel welding offer huge potential . . . Electrode technology is advancing.

◆ THE ACCENT in welding today is on faster and faster production methods with built-in controls making an easier job for the welder. Preliminary reports on the 1954 Census of Manufactures just issued confirm trends apparent earlier from welding manufacturers sales figures. And the end is not in sight.

The census indicated that shipments of electrodes in coils for automatic arc welding almost tripled between 1947 and 1954 from 7.4 to 21.2 million lbs, indicating the extent of the trend toward submerged arc and other automatic welding processes. And ever-increasing sales of iron powder coated electrodes, designed especially for high speed production welding and introduced fairly recently, show the trend is gaining momentum.

Higher deposition rates are also making headway in hard-surfacing through laying down metal rather than using tool steel for wearing surfaces. Census figures indicate combined shipments in 1947 of low alloy high strength and stainless electrodes was less than low alloy high strength alone in 1954.

Stainless Vogue

Shipments for 1947 for these products were 21.7 million lb compared to 37.6 million in 1954. This method of surfacing is coming into increasing vogue in road machinery, quarrying equipment, cement mills, engine crankshaft journals for steel rolling mills.

One factor not indicated in the preliminary report on welding equipment is the growth of the rectifier type welder. These were developed by several of the dozen or so basic equipment manufacturers to compete with existing motor-generator and transformer sets.

Their main advantage is in converting alternating current to direct current without moving parts. Earlier last year, double units were introduced which combine both the rectifier and transformer and offer ac or dc power at competitive prices.

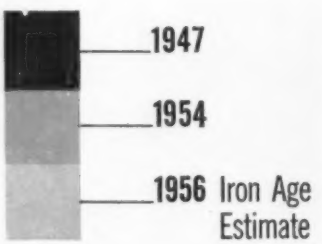
Sales of welding equipment and supplies this year will probably be 10 pct ahead of last year, or approximately $192 million, according to IRON AGE estimates. Most builders feel the steel strike will not materially hold down future sales. Shipments in '47 were $103.7 million, in '54, $168.8 million.

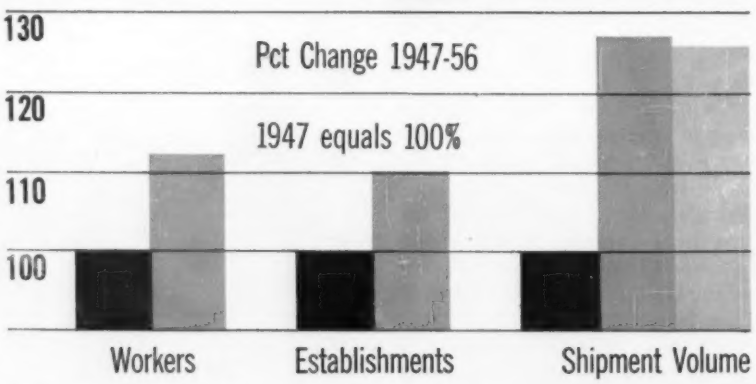
Greatest area of increase is in structural welding where 20 pct saving in amount of steel pays off in lower costs. In states such as New York and California, welded bridges have become almost standard because of the cost saving.

Greatest technological potential for the next few years is building more and more automatic control into high speed production welding equipment. Industry leaders point out that since 86 pct of welding cost is in the labor factor, this presents the greatest opportunity for cost saving.

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., THE IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

The Growing Welding Industry





Source: 1954 Census of Manufactures.

Shipments based on '47 dollars

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NEW: ELIMINATES HYDROGEN EMBRITTLEMENT

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Concentration of Inhibitor Based on Acid Content, Per cent by Weight	DEGREE OF ARC OBTAINED			
	Propargyl Alcohol	2-butyne-1, 4 diol	Commercial Inhibitor "A"	Commercial Inhibitor "B"*
0.00	69	69	69	69
0.25	180	48	43	68
0.5	180	54	36	180
1.0	180	59	77	123
2.0	180	150	103	145
4.0	180	123	66	133
8.0	180	130	133	180

*Contains 11% propargyl alcohol.

chemical intermediate:

Propargyl alcohol, $HC{\equiv}CCH_2OH$, with its three centers of reactivity, primary alcohol, triple bond and active hydrogen, has proven itself a valuable tool in the synthesis of pharmaceuticals, essential oils, agricultural and specialty chemicals.

corrosion inhibitor:

Propargyl alcohol is an excellent corrosion inhibitor for mineral acids and stabilizer for chlorinated solvents.

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Propargyl alcohol is a colorless, stable liquid, infinitely miscible in water, benzene, ethanol and other organic solvents.

$HC{\equiv}CCH_2Br$ Propargyl Bromide

a chemical intermediate and agricultural soil sterilizer

chemical intermediate:

Propargyl bromide, $HC{\equiv}CCH_2Br$, has three centers of reactivity; triple bond, bromine atom, and acetylenic hydrogen. Synthesis of terpinoid structures such as vitamin A, plant growth hormones, etc., is possible through Reformatsky-type reactions. Some propargyl amines and propargyl ethers synthesized from propargyl bromide have physiologic activity as morphine antagonists and hormones. Used in the synthesis of propargyl substituted barbiturates.

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MANAGEMENT

REPUBLIC: New Team Takes Over

Tom Girdler retires . . . Charles M. White becomes chairman and chief executive officer . . . Republic's first chairman retires from position he held since organization in 1930.

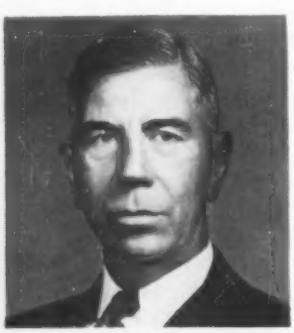
◆ THE CORPORATE chain of command at the nation's third largest steel producer moved up last week following the retirement of Tom M. Girdler of Republic Steel Corp.

The 79-year-old head of Republic had served as chairman and director of the company since 1930 when it was organized with the merger of four steelmaking and fabricating companies. He had previously been president of Jones & Laughlin Steel Corp.

T. M. Girdler

New Posts

Charles M. White, president of Republic, becomes chairman and will continue as chief executive officer. He became president in 1945.



C. M. White

T. F. Patton, formerly assistant president and first vice president, is now president. Mr. Patton was a member of the four-man industry negotiating team in the recent steel strike.

Norman W. Foy, vice president-sales, fills the vacancy on the board of directors created by Mr. Girdler's retirement.

Mr. White's first job in the steel industry was as a machinist's helper with the Americn Bridge Co. He moved to Jones & Laughlin as a millwright helper and became plant superintendent in two years. By 1929 he was general superintendent of the Aliquippa Works. He joined Republic in 1930 and was named president in 1945.

T. F. Patton

Expansion Ahead

Mr. Patton, whose background is legal, joined Republic as general counsel in 1936. In 1953 he was named assistant president and first vice president.

Mr. Foy has been sales vice president since 1953. He joined the old Republic Iron & Steel Co. in 1918 and in 1930 became Chicago district sales manager of the new Republic Steel Corp. He served with the War Production Board in World War II and with the National Production Authority in 1951.

N. W. Foy

Republic now has an expansion program under way to increase the company's ingot capacity to 12 million tons.

Wire Firm Gets Facelift

Expansion and modernization costing more than $1 million is announced by Seneca Wire and Mfg. Co.

Program, which will give the firm in excess of 500,000 sq ft of production floor space, includes erection of a new building, remodeling and enlarging of others, installation of new machinery and equipment, and modernization of the plant's entire electrical system.

Slated for completion within a year, the program will provide improved facilities for almost every department of the mill.

Substantial volume of Seneca's production goes to two subsidiaries: Standard Wire Cloth Co. which recently moved into new quarters at Brookhaven, Miss., and Keystone Wire Cloth Co., Hanover, Pa.

REPORT TO MANAGEMENT

Is Help Coming for Small Business?

While you can prove with statistics that there are more small businesses than ever before, that they never had it so good, everyone knows that small business is finding it increasingly tough to keep its head above water.

Small business is the innocent victim of changing economic conditions that make it more difficult for companies of moderate size to survive and prosper.

These are some of the handicaps that small business faces. Federal tax policies have been especially tough on small businesses. They are having trouble raising necessary capital for plants and equipment and tax policies make it difficult to put profits back into business.

Although the Federal Government may be sympathetic to its problems, most military purchases are of the nature that are most efficiently produced by big industry. This cuts off much of the largest market for industry since the government is the nation's biggest customer.

Research needed for technological developments also handicaps businesses that do not have the ready capital or market depth to warrant large appropriations. The same applies to advertising and market development.

These handicaps, which should be familiar to many small businessmen who have met them, are recognized by government and are noted in a recent report to the President from the Cabinet committee on small business.

What Can Be Done About It

Committee recommendations indicate the government, or at least the Administration, stands ready to do what it can.

It should be noted that the Cabinet committee says any program "must avoid arbitrary restrictions on large concerns that have come to the top through honest competition . . . must scrupulously avoid subsidies of inefficiency."

It does recommend that taxes be reduced from 30 to 20 pct on corporate incomes up to $25,000. It asks formulas of accelerated depreciation for purchases of used property up to $50,000 in one year. Companies with ten or fewer stockholders could be given the option of being taxed as if they were partnerships. Estate taxes could be spread over 10 years if consisting largely of investments in closely-held firms.

In government purchases, it recommends a review of policies. It suggests that need for advance payments not be held against a bidder.

Legislation enabling closer scrutiny of mergers is asked, and that procedural changes be made in antitrust laws to facilitate their enforcement.

While adoption of all these points doesn't in itself assure small business prosperity, it indicates that small business may not be entirely forgotten, that some help may be on the way, if action is pushed properly.

How the PA's See It

It should be no surprise that purchasing agents look on the balance of 1956 with renewed optimism. According to the monthly survey of the National Assn. of Purchasing Agents, there is a definite upturn in new orders.

Some conclusions of the survey: Nickel and steel are again the products most difficult to obtain. Looking back on the steel strike, the PA's report only a few actually had to cut production, only an insignificant number were changing capital expenditure plans.

On production materials, only a few are operating hand-to-mouth, most are 60-90 days ahead, say the PA's.

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2. service **4. research**

Occasionally, you may find local price differentials you think may be worth your while. But no one gives you more of all four than American.

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In service, with a tightly-knit system that meets the needs of the most intricate production lines. Like an appliance manufacturer who uses 120 million American Phillips fasteners a year.

In quality, with a unique quality control program that includes such protection for you as statistical sampling on production runs.

In research, which produced not only the Phillips Head fastener, but showed one customer a substantial saving by converting a three-part, assembled machine screw into a single cold-headed unit.

There are many sources of Phillips-type fasteners. But only at American will you find more of the four basic features you want — price, service, quality, research.

Make your own comparisons . . . send us your inquiry for price and delivery or your specifications for special fasteners. Write:

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KEYSTONE XL WIRE STUDY

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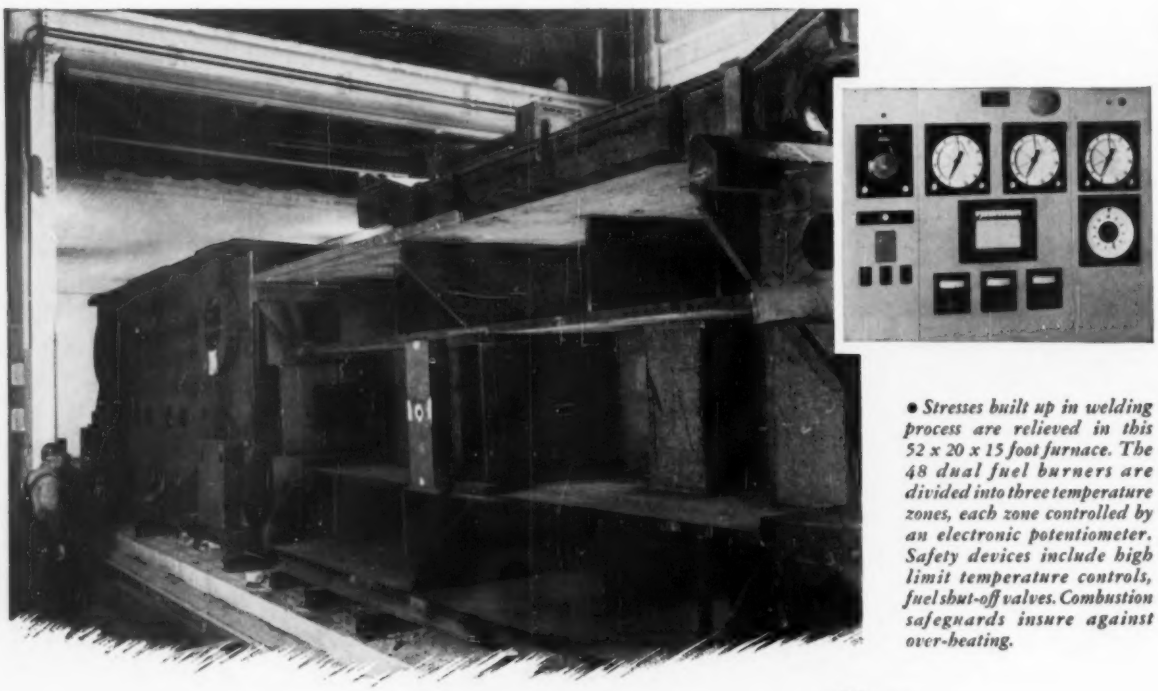
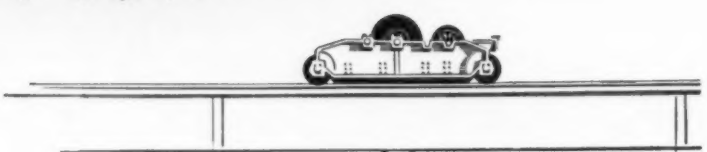
Morgan's stress relief furnace, one of the largest in the world, can raise temperatures 200 degrees Fahrenheit per hour up to 1750° F.

Stress relieving is still another example of the advanced design and construction features that make Morgan cranes the best in the business.

Performance records prove that Morgan cranes cost less to operate and maintain. Let our representative show you how to save the most by buying the best . . . Morgan!



• Stresses built up in welding process are relieved in this 52 x 20 x 15 foot furnace. The 48 dual fuel burners are divided into three temperature zones, each zone controlled by an electronic potentiometer. Safety devices include high limit temperature controls, fuel shut-off valves. Combustion safeguards insure against over-heating.

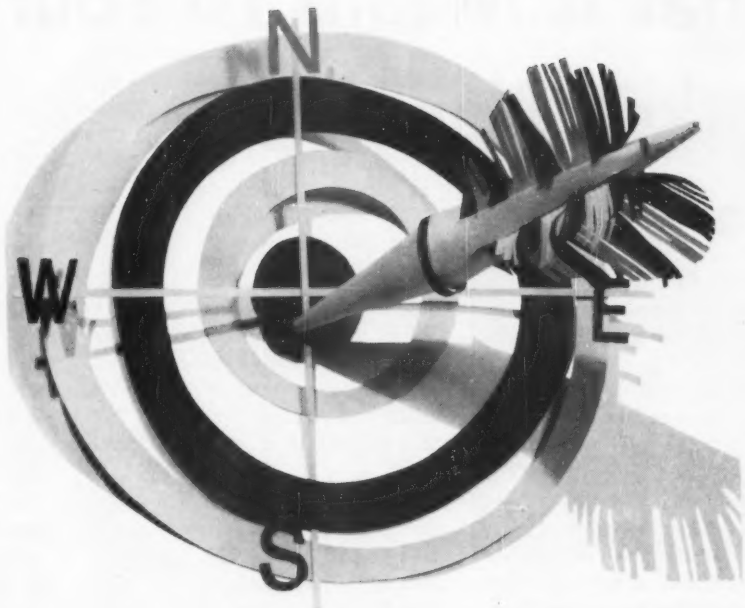


The Morgan Engineering Company, founded in 1868, manufactures overhead electric traveling cranes, gantry cranes, open hearth special cranes, plate mills, blooming mills, structural mills, shears, saws, and auxiliary equipment.

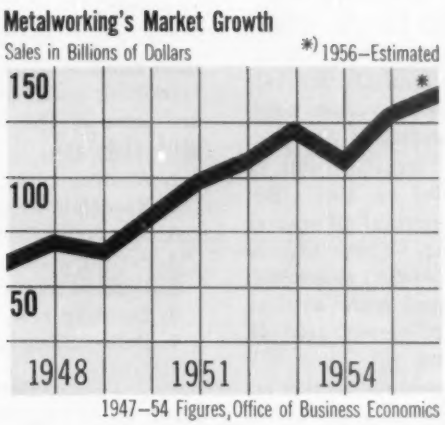
THE MORGAN ENGINEERING CO. *Alliance, Ohio*

THE IRON AGE SURVEY REPORT TO MANAGEMENT

No. 2 of a Series



HOW TO HIT YOUR MARKET



Metalworking's Markets are growing at a terrific pace. And to keep up with them, metalworking management more than ever needs accurate facts and figures to guide its marketing decisions. This report tells you how to use one of the best marketing tools available, the new U. S. Census of Manufactures.

Behind This Report

Interviews with top Census officials and marketing experts for their views on how to use census data for market planning . . . A survey of metalworking firms and their market research activities . . . Actual case histories on market research problems . . . Latest information on the publication of the new census data.

New Census: What It Means To Your Market Planning

◆ HITTING YOUR MARKET can no longer be done by guesswork, hunches, hearsay and "informed" opinions.

Keeping pace with metalworking's growing markets calls for an increasing knowledge of market potentials, industry trends and the facts and figures on which to base business decisions.

Since 1940 the metalworking industry has added about 1.2 billion sq ft of manufacturing buildings. If put under one roof, such a plant, 100-ft wide, would stretch from New York to Denver.

Add to this the tremendous strides made in manufacturing know-how during the same period, and you get some idea of the mountain of goods produced by metalworking firms each year.

Survey Reports

This is the second in a series of articles of particular importance to metalworking management. Watch for other reports in future issues.

If moving part of this mountain to market is your job, then you'll be delighted with the bonanza of marketing information contained in the new U. S. Census of Manufactures.

For here is the first detailed breakdown of the growth in markets, industries and products since 1947. This new census covering 1954 activities, will provide a host of information (see box p. 56) you can apply to your market planning.

Some of the most valuable data for metalworking firms is already available. This is the advance series of releases covering employment and payrolls; value of products shipped; cost of materials, fuels and energy; and total factory shipments of individual products.

While these reports are being published another series of bulletins consolidating 450 industries into 82 major groups is underway. Issued on a state-by-state basis, they give general statistics on product shipments, number of establishments and employment by various industries in each state.

Regional Shifts

State bulletins are particularly important for measuring regional industry shifts and the markets offered by states for various products and raw materials.

Final census bulletins will be generally similar to 1947. But there will be important differences to metalworking. These include more detail on product shipments, materials use and more detailed data on the processes used in metal fabricating.

Having this excellent market research tool at your fingertips is an ace up your selling sleeve. But how many metalworking firms use market research?

An IRON AGE survey of over 250 metalworking firms, both large and small, shows that some 75 pct of the respondents use it to control field sales activities. Of those that don't, about 83 pct said they planned to do so in the future.

Questioned specifically on the Census of Manufactures, 57 pct of the reporting companies found it helpful in sales planning.

Since new product introductions are often a hit or miss proposition, THE IRON AGE asked the same group if they ever used market research to test a new product before tooling up to produce it. Of those replying some 52 pct said they did test products marketwise before they reach the tooling stage.

Whatever the extent of your market research activities, the good you get out of the new census figures depends on the amount of enthusiasm you bring to the task and the judgment you use in applying it.

From this wealth of data can come many of the answers to your marketing problems. Briefly, here are some of the broad uses for census figures:

1. Analyzing market potentials
2. Economic or sales forecasts
3. Measuring industry trends
4. Setting sales goals
5. Distribution studies
6. Locating new facilities
7. Determining sales territories.

Getting Started

One of your biggest problems in using census data is deciding which material will best suit your needs. Knowing exactly what you're after, what's available in the way of reports, and then asking the right questions to get them, are prime factors in using census figures successfully.

You can get help on this from local field offices of the Commerce Dept. or by writing the Bureau of the Census, Washington 25, D. C.

Before applying any specific data be sure you know exactly what it means, what it includes and what it does not. Make sure you check the definition of words. Many terms have very specific meanings. For example "establishment" does not necessarily mean "company" and words like "sales" and "payroll" are carefully defined.

Having census data at hand is one thing. But knowing how to use it effectively is another. Let's look at some of the ways it can be made to work for you.

Any successful selling effort requires a thorough knowledge of the size and location of the potential market for a given product. By studying the production figures of the industries that can use your product you can obtain an overall sales target or quota.

Market Breakdowns

But you can do even more. Since the census gives the total number of plants in each of about 82 industries, this plant total can be broken down further by state and counties and by size. With this breakdown you can concentrate your selling on those areas offering the greatest market for your product.

Further study can tell you how many plants can be covered profitably within a given area, how many salesmen are needed to do the job and where to locate them for most effective sales coverage.

By checking state industrial directories and other sources of information many times you can get an actual prospect list of the companies doing business in areas having the greatest potential.

The Census of Manufactures also plays an important part in long term sales or economic forecasting. In a competitive economy, manufacturing companies must know the rate at which firms using their products are growing in order to judge their own expansion needs.

Here again, the census can be of help. Reports on such subjects as quantity and value of products shipped, fuels consumed, employment trends etc., for various industries are some of the factors for determining the long range sales outlook for an industry.

Geographical plant breakdowns by size and industry also provide a guide in locating new plants, branch offices and warehouses. Through a market analysis you can pick up clues to the most profitable distribution such as direct sales coverage, exclusive distributorships or general distribution through several firms.

For many industries the Census of Manufactures gives the only accurate measure of change over a five-year period.

By comparing your own rate of growth (or decline) from 1947 to 1954 with overall industry figures

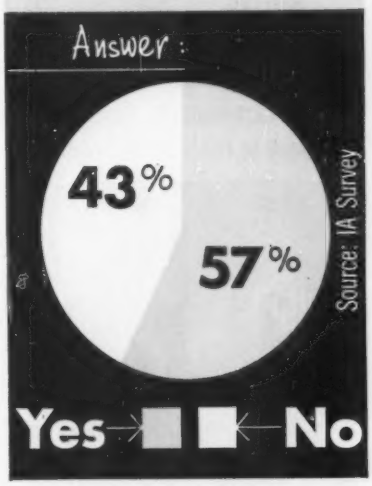
Continued

THE USE OF CENSUS FIGURES

Question:

Has your company ever used the U. S. Census of Manufacturers to aid sales planning?

Answer:



Source: IA Survey

Market Research Activities

Question

If you are using market research techniques, please check which of the following market research activities your company has done:

ACTIVITIES:	Pct.
1. Classifying customers by industry	86
2. Analyzing sales records by industry	81
3. Comparing sales with external yardstick	77
4. Determining adequacy of district sales coverage	75
5. Finding the number and size of plants in each sales district which can use your product	69
6. Other marketing projects	31

Other Projects

Those that checked off other marketing projects were asked to write them in. Here's what they put down in order of most frequent use.

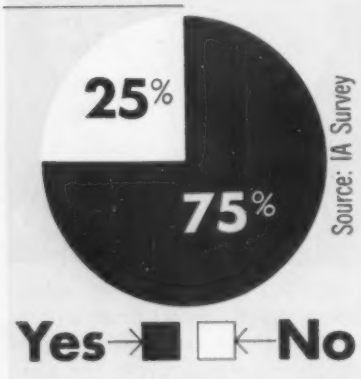
Market potential studies for new products
Sales forecasting
Determining sales quotas
Warehouse and plant location studies
Advertising media studies
New uses for products
Product acceptance studies
Pricing studies
Mailing list development

HOW MUCH MARKET RESEARCH IS USED

Question:

Does your company use market research techniques to obtain better control of field sales activities?

Answer:



you can get an idea of your company's progress over these past seven years.

It may be your growth has been made at the expense of others in the field. If so, first check your figures with the Census Bureau to make sure you're both figuring on the same basis. If the figures are right, you should then give considerable thought to any expansions you may have planned.

Case in Point

Of course, no one source of information can supply all of the data needed to make market studies. The Census of Housing and Population, the Census of Business, as well as data from other government agencies, trade associations and business publications can add measurably to your store of marketing tools.

The Census of Business is particularly useful for metal-working firms selling consumer markets. Covering both retail and wholesales fields it also gives geographic breakdowns on the size of a market and can be applied in the same manner as the Census of Manufactures. For those selling within one industry or to business generally the Census of Manufactures is the best bet.

But used singly or in combination with other statistics it's surprising how familiarity with handling market data can result in quick solutions to marketing problems.

A good case in point is a manufacturer with ten days to decide whether it should exercise its option to the patent rights for a new type of microfilming equipment.

Studies had already been made on the production costs, selling price and distribution methods. However as yet no estimate was made of the potential market for the product.

Here's how the problem was solved. A quick call to the Commerce Dept. revealed that a special Census of Manufactures report on this class of photographic

Census of Manufactures Reports:

What Will Be Published And When—

▪ For over two years, hundreds of Census Bureau workers have been collecting and compiling the vast amount of economic data to be published in the 1954 Censuses. Here are the reports covering the Census of Manufactures and their publication schedules.

1. INDUSTRY ADVANCE REPORTS

Separate reports for over 400 individual industries. Will give general statistics* for: (a) The U. S. with 1947 comparisons; (b) geographic regions and states, with 1947 comparisons for employment and value added by manufacture; (c) quantity and value of individual products primary to the industry, with 1947 comparisons.

PUBLICATION SCHEDULE — Over 200 reports already issued. Soon will be superseded by final reports.

2. U. S. SUMMARY PRELIMINARY REPORTS

Three separate releases covering: (a) general statistics for the U. S. by industry; (b) general statistics for the states for selected major industry groups; (c) value of shipments for about 1,000 classes of products.

PUBLICATION SCHEDULE—Items (a) and (b) already issued. Item (c) within 2 months.

3. INDUSTRY BULLETINS

Separate bulletins for about 82 major industry groups, comprising about 450 individual industries. Will give: (a) general statistics by detailed industry and by states, with historical comparisons; (b) detailed statistics** for the U. S.; (c) general statistics for the U. S. by size of establishments and by product specialization within industries; (d) industry-product analysis for the U. S. metalworking operations by industry, in metal fabricating area.

PUBLICATION SCHEDULE — Now underway, completion early next year.

4. STATE PRELIMINARY REPORTS

Separate reports for each state and the District of Columbia giving general statistics for: (a) the state; (b) important metropolitan areas and larger counties; (c) and for selected major industry groups with the state.

equipment had been made in the 1954 census. With these 1954 statistics and a trade publication census of this same equipment for 1950, the firm determined the rate of growth for microfilming equipment over this five-year period.

The Annual Survey of Manufactures was then consulted for these years to get an idea of the rate of growth for the photographic equipment industry as a whole.

By comparing these two sets of figures, a definite growth correlation was discovered.

Check Competition

With this correlation and a market projection of the photographic equipment field through 1965 (made by one of the major producers), the company was then able to project the market for its particular equipment to 1965.

A further step was to check the competitive strength of the existing market. By posing an actual problem to producers already in the field and asking them the cost of the equipment required to solve it, they were able to get an idea of how the competition stacked up price-wise.

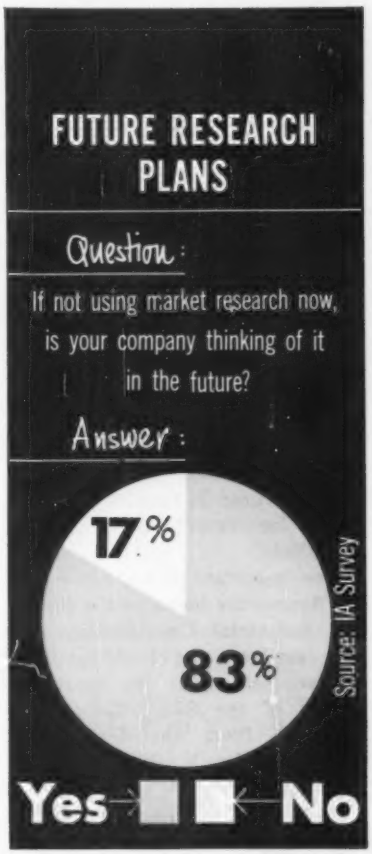
Thus in six days the firm obtained an analysis of the present market, the rate of growth and the competitive situation. On the basis of this information a decision was made exercise the option and market the equipment.

Not many of your marketing problems can be decided as quickly as this one. But the use of sound marketing data can go a long way in warding off sales headaches. Eric Ruckelshaus, marketing expert with Ebasco Services, Inc. considers one of its prime uses the steadying effect it has on making marketing decisions.

On one hand it can keep the enthusiasts from charging off into a new field without a sound understanding of the market. On the other hand concrete market data can bolster confidence in the market potential for a new product.

A good example here is the enthusiastic sales force which estimated sales of a new product could reach more than seven times the existing market volume. This estimate was made even though two strong companies were already in the field. Census figures brought them back to reality and the project was shelved.

Along this line Walter Hoadley, Treasurer of Armstrong Cork Co. sees the Census of Manufactures, among other things, as a good way to settle honest differences of opinion concerning the growth or decline of a particular product or industry. Touching bases periodically with the Census of Manufactures figures, he also feels, provides a source of clues to what your competition is doing and a starting point for further market analysis.



No matter what your marketing problems, don't overlook this new census data. For no where else can you get as good a picture of what manufacturers have been doing since 1947.

Continued

PUBLICATION SCHEDULE — completed.

5. STATE BULLETINS

Separate reports covering each state and the District of Columbia containing general statistics for: (a) total manufacturing for the state; (b) standard metropolitan areas; (c) state economic areas; (d) counties and urban places of 10,000 inhabitants or more, with historical comparisons; (e) by individual industry for the state and standard metropolitan areas, with 1947 comparisons; (f) industry groups for principal industrial counties.

Tables will also show the major establishments in each major industry group by size of establishment and by counties; detailed statistics for the state, standard metropolitan areas and principal industrial counties.**

PUBLICATION—Last quarter 1956.

6. SUBJECT BULLETINS

Separate bulletins for each subject and a summary presenting detailed statistics for such subjects as equipment and payroll, size of establishments, inventories, hp of power equipment, fuels and electric energy, industrial water use and materials consumed.

PUBLICATION SCHEDULE — Following completion of state bulletins, Spring 1957.

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*General Statistics — establishments, employees, man-hours, payrolls, value added by manufacture, cost of materials, value of shipments and new capital expenditures.

**Detailed Statistics—Include inventories, materials consumed, fuels and electric energy used, water use, power equipment in use, detailed products made.

■ **Four bound volumes of the 1954 Census of Manufactures will be published in mid-1957. Here's what they'll contain: Vol. I—U. S. Summary Reports; Vol. II—Industry Bulletins; Vol III—State Bulletins; Vol. IV—Subject Bulletins.**

How To Set Up Market Area Potentials

■ One of the best uses you can make of the new census figures is in setting up market area potentials for your products.

There are different ways of doing this. But regardless of the technique, once armed with the figures you can find answers to several major marketing problems.

First of all you can learn those areas having the greatest potential for direct sales coverage. By comparing market area potentials with actual sales percentages you also can get a measure of your competitive strength in each area.

Other areas where this information can be put to use include: Detection and measurement of market trends; type of sales representation needed (direct, agents, distributors, etc.); number of salesmen needed in each state; determination of sales territory boundaries; establishing sales quotas in each district; location of new plants, warehouses and branch offices.

For those companies selling industrial products the Census of Manufactures is usually the best source for computing market area potentials.

One important point. Since census figures are based on the Standard Industrial Classification system (see box), you should familiarize yourself with its operation. Copies of the S.I.C. Manual are available from the Government Printing Office, Washington, D. C., at a cost of $1.25. In the S.I.C. Manual you'll find a complete list of major classes and types of products produced and marketed in the U. S.

Who Can Use Your Product?

Whichever census figures you use, the accuracy of your market potentials depends as much on the planning you do *before* using the figures as the statistics themselves. Here, step-by-step is *one method* of finding market area potentials with the Census of Manufactures.

1. The first step is to find out the number of industries which can use your product. How do you go about this? Briefly, there are three ways: (a) By analyzing past sales records; (b) By having someone with a thorough knowledge of the product go through the S.I.C. Manual and check off the 4-digit classes he believes can use your product, and (c) By soliciting inquiries.

Each user-industry should then be coded according to 4-digit S.I.C. numbers.

Determine Relative Weights

2. After the user-industries are coded, the next step is to assign relative weights to each industry based on their importance to your market.

Statistics can never replace judgment and judgment plays an important part here. Past sales experience, industry trends, general business conditions, the impact of military spending (if any) should all be considered in rating each industry.

Choosing A Buying Index

3. With the ratings applied to each S.I.C.-coded industry, you now have to choose some index which will indicate *the buying power* of each.

Census figures give three sources: (a) number of establishments; (b) value added by manufacture; and (c) number of production workers. The source most frequently used in metalworking is the number of production workers.

Reason for this is the theory that purchases within an industry vary in relation to company size as gaged by the number of production employees.

The Final Calculations

4. Since the Census of Manufactures lists the number of production workers employed in each industry nationally and by geographic areas (states, counties, metropolitan areas) it's an easy matter to calculate the *proportion* of U. S. production workers by industry for the area you are interested in.

Each industry proportion multiplied by the weight assigned the industry produces a *weighted proportion* for each industry in the area. Adding these weighted proportions and dividing by the sum of the weights finally gives you what you're after—a market potential for the area.

What Does S.I.C. Mean?

■ S.I.C. is an abbreviation for the Standard Industrial Classification system developed by the Federal Government for classifying industries along product lines. All manufacturing industries are grouped in broad categories numbered from 19 to 39. With this numerical system an industry can be classified on a two, three or four-digit basis. The more digits used, the finer the breakdown.

The example below shows how one broad category, Fabricated Metal Products, is broken down into finer product segments.

Two Digit	Product	Three Digit	Product	Four Digit	Product
34	Fabricated Metal Products	341	Tin Cans & Tinware		
		342	Cutlery, Hand Tools & Hardware	3421	Cutlery
				3422	Edge Tools
				3423	Hand Tools (except edge)

Market Area Potential For Internal Grinding Machines

(Illinois—1954)

Standard Classification	Industries	Number of Production Workers	Proportion of U. S. Workers	Weights for Industries	Weighted Proportion U. S. Workers
3541	Machine Tools	4117	.05013	3	.15039
3521	Tractors	41153	.53410	1	.53410
3531	Mining Equipment	8079	.10330	2	.20660
3532	Oil Well Equipment	157	.00541	1	.00541
etc.	etc.	etc.	etc.	etc.	etc.
				Totals 100	= 7.58446
				100	÷ 7.58446
				Market Potential for Illinois	= 7.6

The example above shows how Bryant Chucking Grinder Co., Springfield, Vt., successfully used this method for establishing market area potentials for internal grinding machines.[1]

Since up-to-date census figures were not available at the time the study was made, another source was used for the number of production workers. But if done now, the census would provide an excellent source for this information.

Carrying the Job Through

Making a market potential study of this kind is not easy. But it can pay off in a number of ways. For example, sales quotas for geographic areas are obtained quickly by taking the annual sales forecast and multiplying it by the market potential percentage for each area.

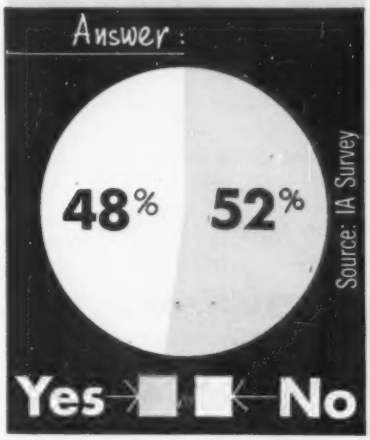
A word of caution. It's easy to be overcome by a wealth of statistical detail and calculations. Before you undertake such a program make sure management is aware of the time it will take, the cost, and the clerical help needed to carry the job through.

If clerical help and tabulating equipment are short there are a number of statistical firms well-experienced in this line of work. A good source for more information about these companies is the American Marketing Assoc., Chicago.

NEW PRODUCT STUDIES

Question:

Has your company used research techniques to determine the market for a new product before tooling up to produce it?



Case Histories: How Market Research Pays Off

Bright Prospects

■ By using the U. S. Census of Manufacturers we were able to locate and evaluate sales territories by areas. Further study provided us with names of plants listed by number and size. This provided an excellent prospect list in addition to enabling us to revise sales territories, relocate and increase sales coverage.—**American Screw Co., Willimantic, Conn.**

The Equalizer

■ In 1955, all our sales territories were re-organized so that each territory covered by our sales engineers has equal market potential. The combined result of the reorganization of territories, more experienced sales engineers, and increased advertising is a 41 pct increase in sales in 1956 as compared with the first half of 1955. —**International Research and Development Corp., Columbus, Ohio**

Straight Talk

■ One major project we undertook was the determination of area potentials and extent of coverage for territorial adjustments. No finished results yet, but survey has made it much easier to talk with straight commission men.—**Enthone Inc., New Haven, Conn.**

New Departure

■ Sometime ago an item came out of our Product Research & Development Group that was somewhat of a departure from our regular run of items. It appeared that it would have good sales possibilities. Our Sales Manager was skeptical and suggested a field survey.

A rather large group of machine tool and metal working machinery manufacturers was interviewed, and without exception, stated that the unit was excellent, and that they would buy it.

Continued

We are now tooling this item, and expect that next year it will account for substantial sales volume and profit. Without a market survey, we would not have produced this item.—**Name withheld on request.**

Sales Calls Up

■ We made an evaluation of territorial coverage sales engineers. Through improved planning and routing, sales calls per engineer were increased 50 pct. Purchase orders per sales engineer increased on the average over 80 pct.—**Industrial Nucleonics Columbus.**

Morale Booster

■ A market research project was undertaken to determine a workable sales target or quota system. This called for a close examination of potentials in each industry. By sales territory, and by product lines and product forms, along with their respective trends. Result was a sales target program which has the entire sales organization, at all levels, working together as a team with high morale and increased activity.—**Crucible Steel Co. of America, Pittsburgh.**

How'm I Doin'?

■ We determined potential in territories by comparing the percent of people employed in industries using our product against total U. S. employment. With our association figures we converted percentages to dollars. Using these figures we told representatives how much business we thought was available and set an objective. Each month we send them sales by products compared to objective and also compared with previous year. Now they know where they are going and they don't have to come to us to find out how they are doing. Before they never knew. Also some of our personnel who thought the rep with the most volume was our best, now realize this is not necessarily so.—**Name withheld by request.**

Switch Emphasis

■ We conducted a mail survey to determine the extent to which a new product could be sold through distributors. As a result of the information obtained, our introductory campaign placed much greater emphasis on the distributor market than it would have otherwise.—**Clark Controller Co., Cleveland.**

Fast Action

■ Following determination of sales potentials in each industrial trading area, based on plant employment, we immediately realigned our sales territories. All concepts based on pure geography have now been discarded. The boundaries of many territories were changed: some were split in half and one was reduced to less than one eighth of its former area.

Using the sales potential of proven territories as a guide, additional salesmen have been added to both new and old territories with the result that each man is responsible for comparatively equal amounts of sales potential. This has provided a physical alignment of manpower that matches the geographical distribution of sales potential.

Such differences in sales potential as still exist are compensated for in an incentive fund scaled to the sales potential of each territory. Some work still remains to be done in adjusting the work load on each man. But in providing equal opportunity and equal pay for similar effort and similar results, we have already achieved a happier, harder-working, more confident sales force and, of course, a substantial increase in sales.—**Holo-Krome Screw Corp., Hartford, Conn.**

Needed More Features

■ We checked the total market size for a product and found it was too small for entry of another company. In another instance, the design of a product already past the tooling stage was largely redesigned when it was learned customers needed other features.—**Square D. Co.**

Growth Areas

■ After careful analysis of the growth pattern of the 4 Western States since World War II, we opened a fully stocked warehouse on West Coast. Similarly, a study of industrial growth in the Southwest has lead to the appointment of a southwestern sales representative. We also plan to open a warehouse there.—**American Pulley Co., Philadelphia.**

More Specialists

■ Our records show sales to various industries. On the basis of independent data the industry mix for each of our territories was determined. Using the sales records of one of our more efficient territories, the potential sales in other territories were calculated on the assumption that each of our territories could do as well as the one used as the yardstick. The results were that Parker began giving increased selling emphasis to these territories and distributors employed sales specialists in greater number. Sales volume has improved considerably. — **Parker Appliance Co., Cleveland.**

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1. Market Potentials in the Machine Tool Industry by F. E. Hummel, Journal of Marketing, July 1954. Other sources include: Appraisal of Census Programs, Dept. of Commerce, Feb. 1954; What You Can Get Out of New Censuses of Business, Printers' Ink, Dec. 2, 1955; How to Find, Classify, Contact Your True Market Potential, N. R. Kidder and F. E. Hummel, Sales Management, July 15, 1955.

ACKNOWLEDGMENTS

The editors wish to thank R. W. Burgess, Census Director; Francis E. Hummel, The Bassick Co.; Nathaniel R. Kidder, Technical Marketing Associates; Oliver Johnson, Iron Age, Research Director and the many metalworking companies which participated in the survey, for their fine help in preparing this material.

■ *Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept.,* THE IRON AGE, *Chestnut & 56th Sts., Philadelphia 39, Pa.*

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NEW SNAP-ON MOTOR CLIP REPLACES 4 PARTS

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INDUSTRIAL BRIEFS

Far Flung . . . The Colorado Fuel & Iron Corp.'s Wickwire Spencer Steel Div., Buffalo, N. Y., has awarded a contract to The Gas Machinery Co., Industrial Furnace Div., Cleveland, to install a 40-ft wire patenting furnace with a 20-ft lead quench tank for its Palmer, Mass. Plant.

Hatchet to Ratchet . . . The United States National Museum at Washington, D. C. is engaged in enlarging its collections and exhibits for its new Hall of Tools. It is planning to have an historical series of exhibits showing the development of hand tools, mechanical tools, power tools, precision tools, and automatic tools.

Ideal Deal . . . U. S. Industries, Inc. has acquired all assets of Western Design & Manufacturing Corp., Goleta, Calif. The West Coast company stockholders received approximately 30,000 shares of USI's common stock. It will be operated as a division of U. S. Industries.

Third Oak Leaf Cluster . . . S. R. Rosen, chief engineer of the U. S. Automatic Corp., Amherst, O., received his third award from the Technical Papers Subcommittee of the National Screw Machine Products Assn. for his paper on the design of a profile turning slide.

Way Back East . . . Kaiser Aluminum & Chemical Sales, Inc. established a new warehouse near Harrisburg, Pa., to facilitate the distribution of Kaiser Aluminum products in the northeastern states. It enables the company to provide one and two-day service to its customers. Products to be distributed include roofing, sheet and accessories, shade screening and irrigation tube.

Thicker than Water? . . . A new type of corrugated box with inner and outer laminations of aluminum foil for long distance shipping of whole blood has successfully completed a six-month test at the Blood Bank Foundation, Nashville, Tenn. The carton eliminates the expense of storing or returning the standard blood-shipping container. Moreover, the number of hours that a shipment can be safely in transit has been increased by 25 pct.

Dividends . . . Three companies have joined the Investment Casting Institute, Chicago. The firms include: Defense Operations Div., Chrysler Corp., Detroit; Corning Glass Co., Corning, N. Y.; and the Accessories Div., Thompson Products, Inc., Cleveland.

Takes Ribbing . . . Dravo Corp., Pittsburgh, has been appointed distributor in the U. S. and Canada for floor joist bridging manufactured by the Rite-Type Steel Bridging Co., Fair Oaks, Pa. A ribbed steel joist bracing designed to meet the need for stronger floor support, it is used primarily in residential, commercial and light industrial construction.

Million For Defense . . . The Atomic Energy Commission approved construction of a prototype reactor plant to power a small submarine. It will be built at the Nuclear Engineering and Development Laboratory being established near Windsor, Conn., by Combustion Engineering, Inc., New York City. Estimated cost of construction is about $1 million.

Reservation Now? . . . The Board of Directors of The Material Handling Institute, Inc., has selected June 9-12, and Cleveland, O. for the MHI Exposition of 1959.

Saved by the Bell . . . The Bullard mechanical back-up alarm, developed by The Bullard Co. for trucks, is a self-contained unit which attaches to rear wheels. An alarm rings only when vehicle is in reverse, to warn anyone who happens to be behind the vehicle.

Gas Man . . . Rockwell Manufacturing Co. opened a modern gas meter research and development laboratory in Dubois, Pa. to permit run wear and endurance tests on diaphragms, complete meter mechanisms and gears. The department will engage in making comparative corrosion tests on materials already in use in meters and proposed future materials.

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Producers Eye Fourth Quarter Record

Sudden sales spurt after nine months of sluggishness revives optimism in Detroit . . . American Motors and Chrysler register substantial gains . . . Truck production is unseasonally high—By T. L. Carry.

◆ ADDING SUBSTANCE to automotive industry forecasts of a strong 1957 as well as a strong fourth quarter 1956 that could be an industry record for the period of the year, are creeping sales advances reported by an advancing number of motor car manufacturers.

American Motors has announced that retail sales of the company's cars have begun moving out in the first reporting periods of August, with a cracking 47.7 pct gain over the same period in July.

Nash, which has done the same thing and notably, did it back in 1954 when the entire auto industry was only slowly emerging from a rather bad year. Hudson deliveries are up 42.2 pct in the opening weeks of August and Rambler sales have pushed 53.5 pct ahead of July of this year and 7.8 pct over the comparable period in 1955.

Production is High . . . Chrysler Corp.'s Chrysler Division followed through with a report that sales are up 9.2 pct in the past 10 days over the 10 days preceding, and that overall sales for the same period are just about the same figure ahead of output one year ago.

Ward's Automotive Reports indicates that the industry can be expected to turn out 103,181 cars this week as compared with 108,155 passenger cars one week ago, but it's well to remember that the model changeover is now beginning to be felt. And despite the normal seasonal slump in total number of trucks and cars manufactured, the number of trucks produced is currently reaching levels attained last May.

In the truck category, return of Willys Motors to production has had an effect in boosting overall truck production, but both Dodge and Chevrolet have boosted truck output, despite parts shortage.

Bigger 1957 Sales . . . The sales advance, if it presages a strong fourth quarter, comes at a time when American Motors can fully appreciate the help. The company suffered a $7,871,802 loss in the nine months ending June 30, and this in a period when the company had marketed $10,652,229 in holdings in a subsidiary company.

American Motors gives several reasons for its expectations of a better 1957. (1) Stocks of finished cars on hand have been reduced, and the sales upturn of August should reinforce this hopeful trend. (2) Company officials feel that the earlier announcement of the 1957 models will push the company's 1957 model along faster, particularly in the case of the Rambler.

At the same time, Oldsmobile reports from the used car front, that its used car sales have advanced to within 9 pct of record-breaking 1955, and that dealers' stocks on hand are now at slightly under 23.8 days supply, called by Oldsmobile spokesmen, ". . . . very

The Big Blow: Ford Tests Streamlining

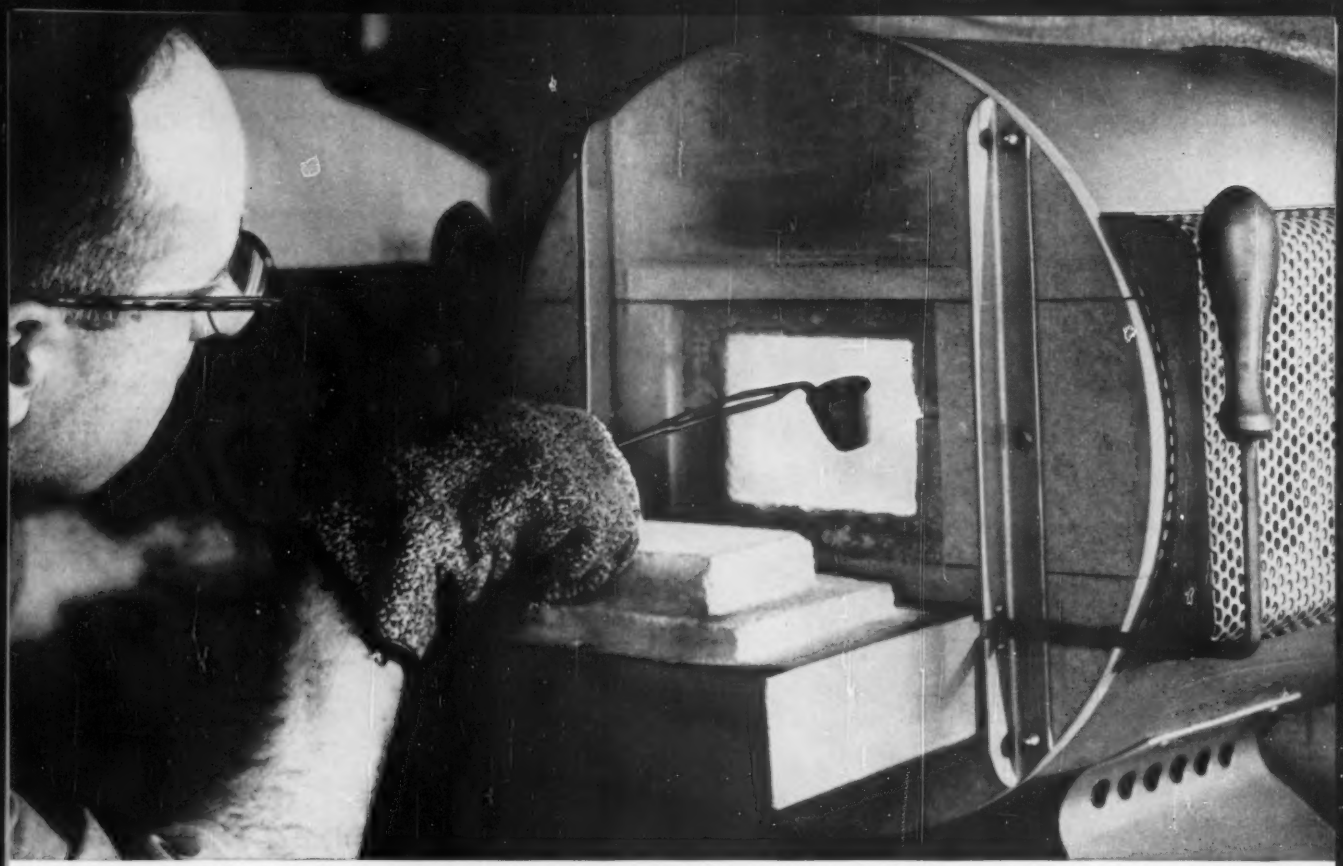
■ **Since the 1930's automotive designers have looked to aircraft shapes when styling new cars. Now, Ford Motor Co. is about to embark on actual tests to see how aerodynamic their styles really are.**

Ford recently began construction of a device well-known to the aircraft industry—a wind tunnel. It's part of the company's Research and Engineering Center in Dearborn.

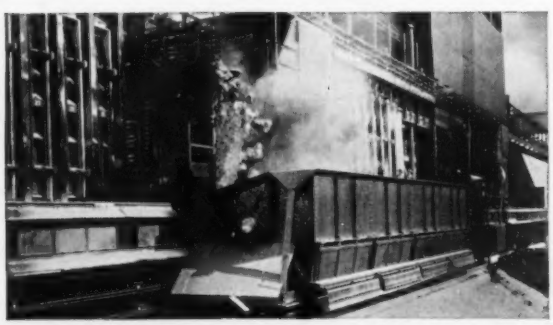
Capable of developing air speeds up to 125 mph, the tunnel is expected to show some of the effects high speed driving has on cars and trucks. It is hoped the tests will enable them to develop more efficient aerodynamic shapes, better seals, and quieter interiors.

A single 20 ft fan, driven by a 2500 hp motor, will generate desired air speeds. A 2000-ton refrigeration system will permit cooling the air down to 0° F. The air also can be heated up to 150° F to simulate desert driving

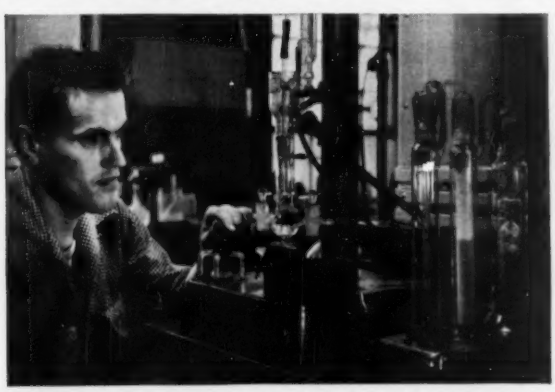
The tunnel is made of reinforced concrete lined with a prefabricated sandwich of aluminum-faced cellular insulation. All seams are vaporproof to permit close regulation of humidity.



How Great Lakes Steel *blends* quality



COKE OVENS eject tons of flaming, quality controlled coke into cars for rapid delivery to quencher. Then . . .



SAMPLES ARE ANALYZED carefully to determine the amount of sulphur in the coke used in the blast furnaces.

Take five kinds of carefully selected soft coal. Blend well. Bake in a 2500° oven for 15½ hours. And if every step has been checked and double checked, the way it is at Great Lakes Steel, *presto!* You get pure, hard coke—the vital ingredient for reducing ore to high-quality pig iron.

Above, you see Great Lakes special coke recipe (cut in millionths, of course) being checked for ash impurities, a very important step in the complete analysis.

First, a sample of each kind of coal is burned to a cinder in the test furnace. Then the painstakingly mixed blend gets this dress rehearsal heat treatment, too. And this makes doubly sure that the blast furnaces produce quality iron . . . iron to make steel that meets customer specifications *to the letter!*

Quality control from raw materials to finished product—that's Great Lakes Steel! May we help you?

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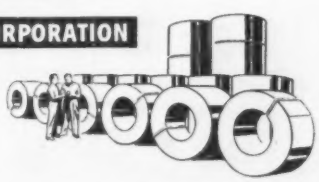
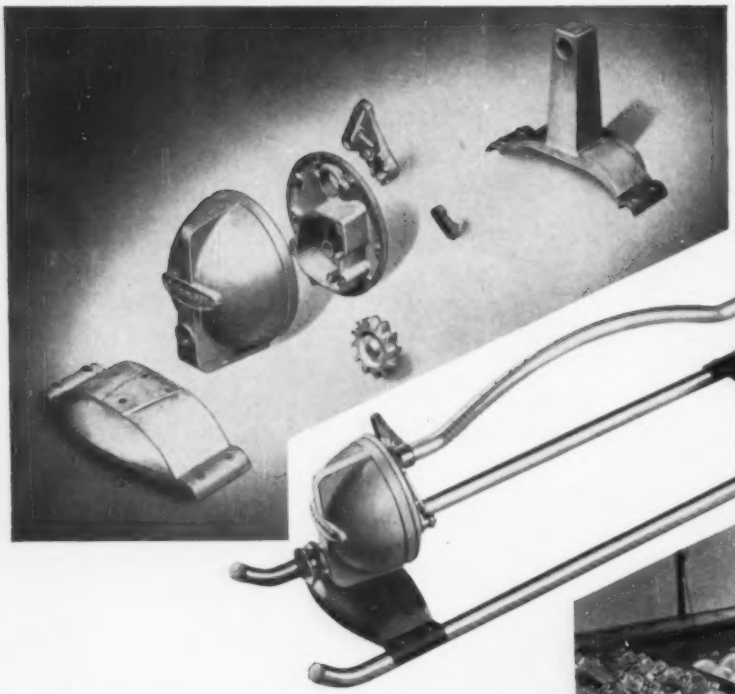


District Sales Offices: Boston, Chicago, Cincinnati, Cleveland, Grand Rapids, Houston, Indianapolis, Lansing, Los Angeles, New York City, Philadelphia, Pittsburgh, Rochester, St. Louis, San Francisco, Toledo, Toronto.



PRODUCTION SHORT CUTS
WITH
ZINC
DIE CASTINGS

NUMBER 4
OF A SERIES

A back and forth motion of the Swingin' Spray sweeps a uniform rain-like spray over a rectangular area of up to 2400 sq. ft. Its "Perma-Sealed" motor unit completely separates the water flow from the motor. Grit and dirt stay out—lubrication stays in!

Covering the ground at MELNOR

Melnor's Swingin' Spray oscillating lawn sprinklers were designed to be sold with a year's unconditional guarantee. This means, of course, that they have been built to high engineering and manufacturing standards. Thus the selection of ZINC Die Castings for seven of the principal assembly components is of special significance.

Because of the unusual contours of the components illustrated, it is obvious that die casting is the most practical method of production. And, when all of the requirements of strength, weight and corrosion resistance were fully considered, Melnor engineers found that ZINC alloy was the metal that would do the job best—at lowest cost. All holes, recesses and projections are obtained in the casting operation, thus greatly minimizing secondary work prior to assembly, and the smooth, as-cast surfaces of four of the parts are easily and economically coated with bright yellow and dark green enamels.

The production and sales advantages imparted to this motor-driven sprinkler by ZINC Die Castings are typical of those found in a wide variety of products. For 80 additional examples send for our booklet "The End Uses of Zinc Die Castings" and ask any commercial die casting company for die casting design assistance to improve *your* products.

ZINC
FOR DIE CASTING ALLOYS

The New Jersey Zinc Company, 160 Front St., New York 38, N. Y.

The research was done and the Zamak die casting alloys were developed with

HORSE HEAD SPECIAL (99.99 + % Uniform Quality) ZINC

Automotive Production

(U. S. and Canada Combined)

WEEK ENDING	CARS	TRUCKS
AUG. 25, 1956	69,501	19,232
AUG. 18, 1956	102,638	24,037
AUG. 27, 1955	133,693	21,532
AUG. 20, 1955	138,209	21,316

*Estimated. Source: *Ward's Reports*

good position for this time of year."

National Show Revived . . . If these are harbingers of a good automotive sales year at the retailer level, then the producers are certainly stretching every seam to nurture this gentle increase into a full-blown sales boom. Beginning December 8 in New York City, the automotive industry will revive the National Automobile Show, an event that hasn't graced an exhibition hall since 1940, though once it was the highlight of the automotive year.

But the big question that has the industry wondering is the amount of money available for financing new car purchases. The recent freeing of credit by the Federal Reserve was a drop in the fiscal bucket. Big finance companies are not comfortably fixed for credit to extend to would-be new car owners. An easing in credit would do the minor sales upsurge more good than spring rain does the good green corn. Meantime, introduction of new models, reduction of dealer inventories, and stronger used car sales, are freshening sales hopes for latter 1956.

SAFETY:

New devices for 1957 models are closely guarded.

Though a number of automotive veterans are pointing out that optional auto-installed safety devices did little to boost auto sales in 1956, auto builders are again indicating they'll use safety as a feature point in the stiff sales competition that seems to be shaping up for 1957.

Ford has indicated that, while a number of its safety devices are secret until new models are formally introduced, the company will have sufficient safety aids to make it a leader in Big Three competition for a safer car. The dish-type steering wheel, for instance, was a Ford first in 1956.

General Motors, Ford, and Chrysler were unanimous in adopting safety door locks in 1956, and about one Ford in ten sold has been equipped with safety belts, an optional safety device.

Seat belts have attracted the most attention in the general press, but padded dashboards have shown far greater real buyer attraction. With only 10 pct of Ford buyers indicating a preference for a car equipped with seat belts, at least 45 pct of buyers have requested the padded dashboard and padded sun visors.

American Motors, it is generally reported, has told congressional committee members that additional safety features will be featured in the 1957 Hudson-Nash sales campaign. Included in the American Motors program is a series of comparative crash tests being conducted by a university research department.

AUTOMOTIVE NEWS

Mr. Romney told the House Subcommittee on Traffic Safety that car service records suggest that Hudson and Rambler cars "are at least 30 to 35 pct safer." In case there is doubt, Mr. Romney has announced that the test results will be published and made available to the automotive industry.

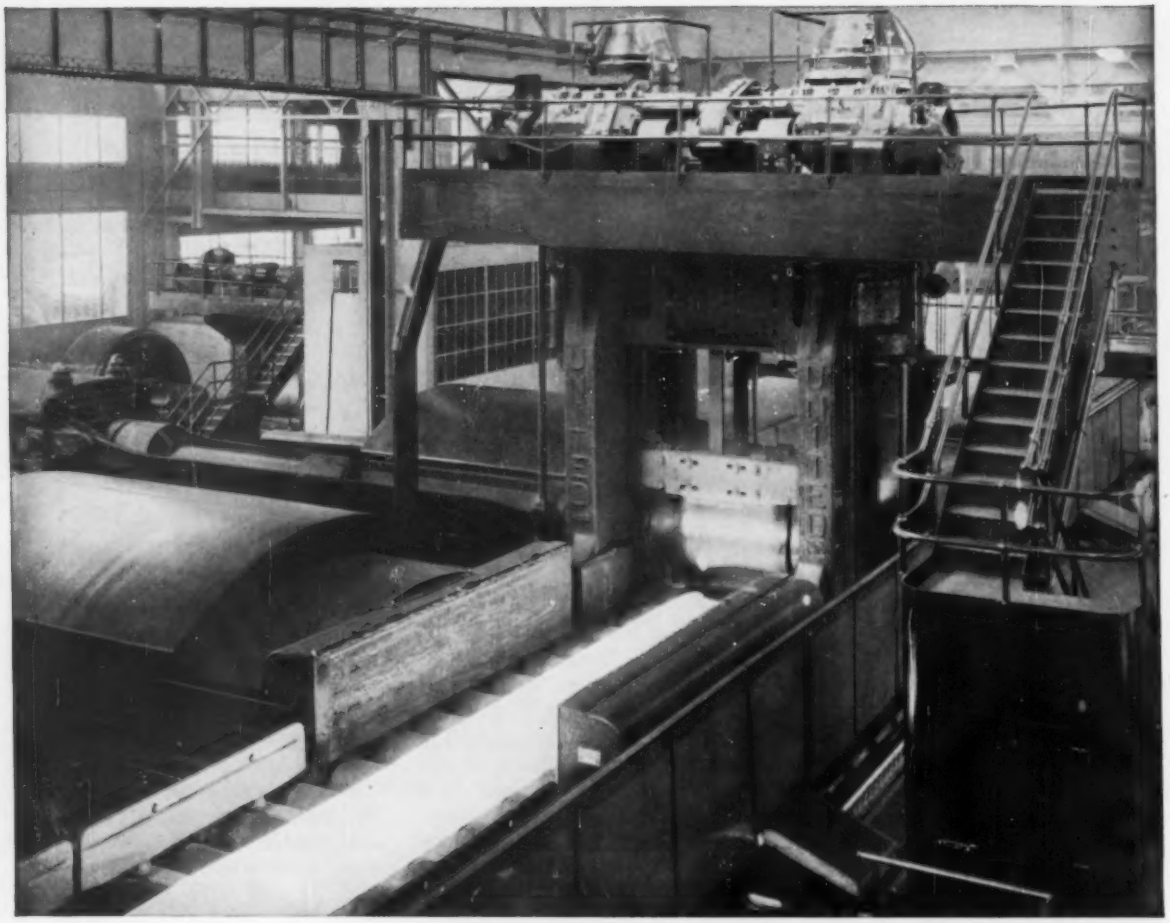
An interesting note on the past history of automotive safety devices with respect to their effect on sales: Nash introduced a safety belt in 1949 with very little reaction from the buying public.

AMC Cargo Vehicle

A kind of triple threat cargo trailer for military use, and designed specifically for air transport to distant points, is the recent result of an American Motors research project for the Air Force. Army Ordnance is also looking over the six vehicle family, which offer cargo capacities ranging from 500 to 10,000 lb with retractable wheels.

THE BULL OF THE WOODS — **By J. R. Williams**

YES, I'M NEW UP IN THE DRAFTING OFFICE--KIND OF AN APPRENTICE-- BUT TH' BOSS SAID I CAN ENLIGHTEN YOU ON ANYTHING YOU DON'T UNDERSTAND IN THIS DRAWING!
WELL, HERE'S A NOTE TO GIVE HIM-- "THANKS FOR SENDING A MAN WHO HAS GIVEN US THE MOST INTELLIGENT, UNDERSTANDABLE INFORMATION THAT HAS COME FROM YOUR OFFICE IN YEARS ABOUT A DRAWING!"
THAT POOR GUY WILL THINK THAT NOTE SHOULD BRING HIM A PROMOTION, WHEN THEY'RE BOTH USIN' HIM IN THEIR OLD FEUD!
WELL, IT'S NICER TO BE USED IN TH' HIGHER BRACKETS THAN TO BE SENT FOR A LEFT-HANDED MONKEY WRENCH!
THE PAWN
8-27 J.R.WILLIAMS
© 1956 by NEA Service, Inc. T.M. Reg. U.S. Pat. Off.



Your gear drives need this extra protection

ENCLOSED gear drives for roll stands get extra protection when lubricated with *Texaco Meropa Lubricant*. Here's why:

Texaco Meropa Lubricant embodies extreme pressure properties that toughen its lubricating film to withstand shocks and heavy duty loads far in excess of severe operating requirements of gears and bearings. These EP properties are notably longer lasting than those of other lubricants.

Texaco Meropa Lubricant contains polar additives that give it exceptional adhesive properties — it clings to the gear teeth under the most adverse conditions.

In addition, *Texaco Meropa Lubricant* is noted for its ability to resist heat-induced thickening. It will not foam and will not separate in use, storage or centrifuging. It is non-corrosive to gears and bearings.

A Texaco Lubrication Engineer will gladly give you full information. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

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The Texas Company, 135 East 42nd Street, New York 17, New York.

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FOR STEEL MILL GEAR DRIVES

Will U. S. Shift Foreign Aid Emphasis?

Soviet success with economic promises prompts study . . . Senate may re-evaluate military aid in favor of economic gifts . . . Military assistance programs may taper off in future—*By G. H. Baker.*

◆ THE WHOLE CONCEPT of United States foreign aid may be drastically shaken up next year. As a result, the government may cut back sharply its purchases of military hardware for shipment to our allies and step up its procurement of civilian-type equipment.

A top policy-writing committee of Congress is spending from now to the end of this year in a careful study of U. S. foreign assistance. One of the top questions to be answered by January 1 is this:

Economic Question . . . In view of the success Russia has had in winning converts with promises of power plants, fertilizer, and dams, should the U. S. follow suit? Should we now begin to taper off foreign military assistance programs and replace them with programs of economic assistance, both bigger and better than those offered by the Reds?

Sen. Green, D., R. I., who will head the Senate Foreign Relations Committee next year if the Democrats retain their majority, is directing the study. He has ordered a special committee staff to come up with answers to such questions as these:

Can we win more allies with economic gifts than with military gifts?

U. S. foreign aid is now basically military aid. Should we dump this concept in favor of undertaking to build public works for our allies?

Can the same U. S. foreign aid policy be applied equally in all parts of the Free World? Or, should we continue to emphasize military aid in some areas and civil projects in others?

The special committee expects to spend $300,000 between now and December 31 in trips abroad to learn the answers.

Express Costs Up?

Sending products by rail express from and to points in much of the eastern and midwestern U. S. may become a more expensive operation soon.

A new plea from the railroad-owned Railway Express Agency to the Interstate Commerce Commission asks authority to put a 15 pct surcharge on l.c.l. merchandise shipped from and received at points in territory served by eastern rail lines. This territory lies generally north of the Ohio River and east of the Mississippi, but includes part of Virginia and West Virginia.

Nearly all types of shipments, including all machinery and metalworking equipment, would be subject to the surcharge. Railway Express says the additional income is needed because service costs are in excess of express revenues.

In the agency's petition to the ICC, losses claimed as a result of express service are related to annual passenger service deficits of the eastern railroads. "Express traffic," says the petition, "should be priced so as to more nearly meet its share of passenger service expenses."

Don't Get Trigger Happy

▪ In this era of push-button war, one of the greatest hazards is how to keep some eager beaver from pushing the wrong button, thereby triggering the greatest war in history.

▪ One of the leading authorities on guided missiles, T. F. Walkowicz, says war and destruction by accident is "so possible that it's frightening."

▪ For example: An electrical storm of sunspots could give the impression through radar of an attack by enemy guided missiles. A nervous operator misreading the spots, would pass the word on to higher headquarters, causing U. S. missile commands to retaliate with intercontinental atomic missiles.

▪ Experts agree that half the planet could be destroyed before anybody discovered that it was all a mistake.

VANCORAM FERROCHROME-SILICON ALLOYS

PRODUCED UNDER STRICT QUALITY CONTROL... PHYSICALLY CLEAN... UNIFORM IN QUALITY

Many years of manufacturing experience and careful attention to the steelmaker's requirements have resulted in these two distinctive ferro alloys.

LOW CARBON GRADE— This Vancoram alloy serves the dual purpose of adding chromium to stainless steel and recovering oxidized chromium from slag.

Chromium	39/42%
Silicon	40/42%
Carbon	.05% Max.

MEDIUM CARBON GRADE—This Vancoram alloy is recommended for adding chromium and silicon to low alloy steels and cast iron; its high solubility permits ladle or furnace addition.

Chromium	48/52%
Silicon	25/30%
Carbon	1.50% Max.

Contact your VCA representative for full information on Vancoram ferrochrome-silicon alloys and other Vancoram alloys.

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Why Los Angeles is Third in Industry

Setting new records, Coast city expects $6 billion in product value by year's end . . . It's a fast growing market which Eastern manufacturers aren't satisfying . . . Aircraft's only part of growth story—By *R. R. Kay.*

◆ IT'S NOW OFFICIAL. Metropolitan Los Angeles is the third largest industrial center in the U. S.

The area chalked up a $3 billion gain — 149 pct — since 1947, with value of manufacture hitting a record $5.1 billion. It forged ahead of Detroit by $400 million and beat Philadelphia by $1.1 billion. That's the latest from the U. S. Census of Manufactures. And its importance as a market is still growing.

Races Windy City . . . People on the West Coast look for a $6 billion figure by year-end. At this phenomenal growth rate, Los Angeles could well pass Chicago when the next census rolls around in the early 1960's.

Right now, Metropolitan Los Angeles is second in the country in manufacturing plants: 14,492. Chicago is next with 13,513.

Satisfied? . . . There's a tremendous mass-consuming market here which eastern manufacturers aren't satisfying. Metalworking men and management across the country could upgrade West Coast sales promotion and industrial expansion programs to advantage.

Some interesting statistics on the Farwest from the 1954 Census of Manufactures: (1) Transportation equipment industry shot up to $1.8 billion, a 345 pct hike! (2) Also skyrocketing along: instruments, with a 277 pct gain; electrical machinery, including electronics, up 260 pct.

In terms of new jobs created, the boom put 277,000 more workers on Los Angeles' payrolls. That's up an impressive 50 pct since the 1947 census. Total employment in 1954: 636,016. But today's figure is 706,000.

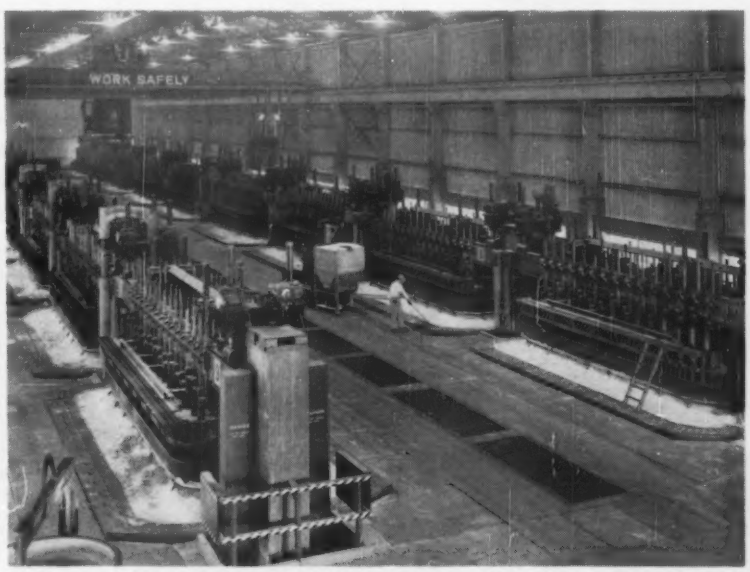
Not on Aircraft Alone . . . Industrial expansion goes on at a brisk pace. Some $224 million went into new and expanding industries during the first seven months of this year. And the outlook for more of the same is bright indeed. Every new plant creates more new jobs and urgency for more consumer goods and services.

Many easterners think Los Angeles' industrial output is mainly in aircraft. It's not so. The economic base is broad. There's plenty going on in fabricated metal products, guided missiles, machinery, electronics, and ordnance.

Jets for British

Seattle's Boeing Airplane Co. is looking forward to more big orders for its 707 jetliners. (See THE IRON AGE, West Coast Report, Aug. 23, 1956.) Reports from London have it that British Overseas Airways Corp. plans to order 15 jetliners, a deal involving from $85 million to $110 million.

Boeing, meantime, bought 17 acres of land next to its present operations center in Renton, near Seattle, for expansion of its transport division.



NEW POTLINE at Kaiser Aluminum's Tacoma, Wash., reduction plant has increase output 10 million pounds. The eighteen, 100,000-amp vertical stud Sodberg pots are nearly twice the size of conventional pots.

Backbone for any job...

"Solid-Back" Column

...New Kearney & Trecker TF Series milling machines have it...backbone for the precise tool room job and... "plenty of beef" for rugged duty milling

TF Series milling machines available under Tool-Lease program.

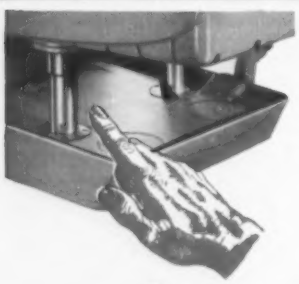
THE solid-back column is an outstanding example of Kearney & Trecker advanced engineering. This one-piece, cross-ribbed, solid-back column is the most important single element of the machine. Every inch of metal is scientifically distributed to add rigidity where it's needed the most. Thus the column readily absorbs all the heavy work loads supported by the heavier, wider knee, and also all torsional thrusts to the cutter transmitted through the heavy-duty, three-bearing spindle and double overarms.

What's more, the heavier column base is specially designed for the new, exclusive twin screw knee support—the only balanced-design arrangement offered today.

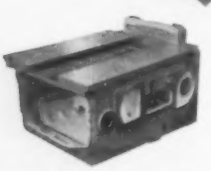
In addition, the new TF's give you other outstanding design and operating features, never before available on any knee-type milling machines. TF milling machines are built in five sizes — No. 2 to No. 6 from 10hp to 50hp in Plain, Universal and Vertical styles.

For facts and figures that will help you — ask about TF's — the latest in milling machines. Contact your Kearney & Trecker representative — call him or mail coupon direct to factory today.

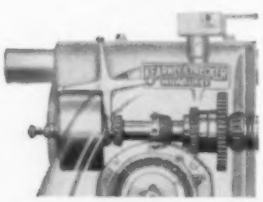
A few more of many reasons why TF Series milling machines are way out front in rigidity



Twin Screw Knee Support — Exclusive double-support arrangement most effectively distributes weight of new machines' much wider, heavier knee, saddle and table. Balanced design substantially increases stability under heaviest loads . . . offers greater resistance to torsional thrust under all cuts . . . halves the wear factor, assuring greater, longer-lasting accuracy.



Heavier, Wider, One-Piece Knee — The TWIN SCREW arrangement supports the heavier, larger knee. Span and length of ways are increased considerably, providing fuller saddle support . . . lasting accuracy . . . substantial reduction of way and gib wear.



Three-Bearing Spindle — Complete assembly consists of three heavy-duty bearings, flywheel, a train of wide-faced forged steel gears. Rigidity of spindle unit contributes to increased cutter life . . . excellent finish . . . quieter and vibrationless operation under all cuts.

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DESIGNERS AND BUILDERS OF PRECISION AND PRODUCTION MACHINE TOOLS SINCE 1898

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Please send me Catalog No. TF-50 with details on new line of TF Series Plain, Universal and Vertical milling machines.

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Company.....

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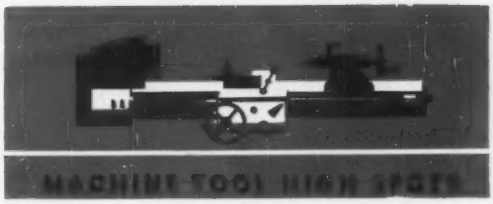
City.....Zone.....State.....



What Do The Statistics Really Mean?

July shipments of metal cutting, grinding machines drop off from previous month . . . Shipments up from year ago . . . But orders about the same . . . What's the significance—*By E. J. Egan Jr.*

◆ JULY SHIPMENTS of domestic metal cutting and grinding machines totaled $65.4 million, a drop of almost $11 million from the previous month. Builders see nothing alarming in the reported dip, simply attribute it to vacation schedules which cuts plant output every year at this time.

But summer doldrums seem to have affected the rate of incoming business, also. Gross total of new orders for July is estimated at $66.6 million by the National Machine Tool Builders' Assn. This is a shade under the June figure of $69.4 million. However, net new order totals (gross figures less cancellations) shape up almost on a par with previous months: $62.1 million in July compared to $61.9 million in June.

Comparing the industry's current new order and shipment statistics with those of a year ago presents some interesting sidelights. For example, shipments last month were $20 million ahead of the July, 1955 rate. But new orders are just about where they were 12 months ago. That fact must be causing builders some concern.

Look at it this way . . . Last July and August, with monthly new business hovering around the $60 million mark, the industry was assumed to be "marking time" while it got ready for the big Machine Tool Show in Chicago. The tempo of new orders pepped up after the Show was over. Customers started climbing aboard the bandwagon in October. In December, the new order total hit an all time, peacetime peak of $151.3 million.

New business continued to roll in at better than $100 million per month as 1956 got underway. It appeared that the industry had established a new plateau from which to count its monthly orders. But in February, net new business fell off to $81.3 million, and the curve has been generally downward ever since.

Builders are trying to stimulate sales in every possible way, to keep plants and skilled workers producing at top efficiency. Chances are that it won't be an easy job, since many of them are being forced to raise their prices for the second time in less than a year.

Price Factor . . . Last fall and winter price increases averaging 10-12 pct were applied to the new and improved equipment models introduced at the Chicago Show. Now, hikes in the cost of labor, steel and miscellaneous machine tool components are forcing another boost in price tags, ranging this time from 5-15 pct. Move was instituted by a few major builders, will likely be followed by most others in the next couple of months.

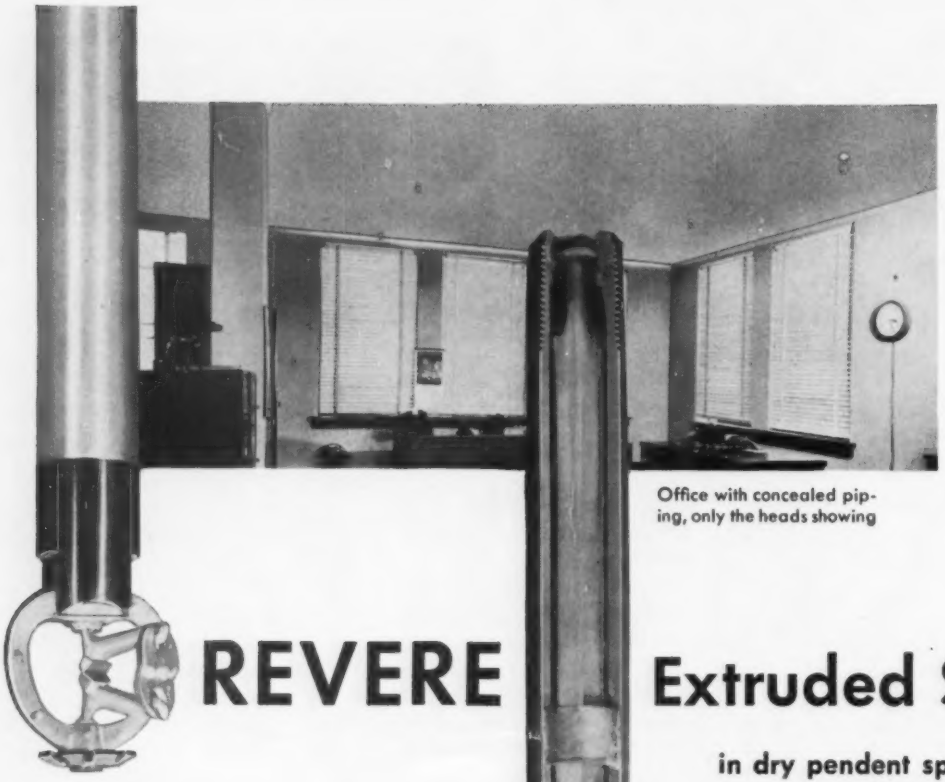
To most industry observers, price boosts that are not reflected in proportionately higher monthly order totals mean just one thing: fewer machine tool units are being purchased compared to the number bought a year ago. From this another premise can be drawn —that the average age of metalworking equipment in U. S. industry is increasing despite major efforts to reverse the trend.

Other Side . . . Counter argument put up by many builders is that one 1956 model machine tool often does as much work as two machines of 1955 vintage. They add weight to this claim by pointing out also that fewer operators are needed on modern equipment.

Best guess is that there is some truth on both sides of the argument. Average age of tools in use is probably climbing, but not as rapidly as it would if builders were not making spectacular improvements in machine productivity.

Months ahead will see sales, promotional pressure stepped up considerably by builders.

"Your raise isn't that substantial!"



Office with concealed piping, only the heads showing

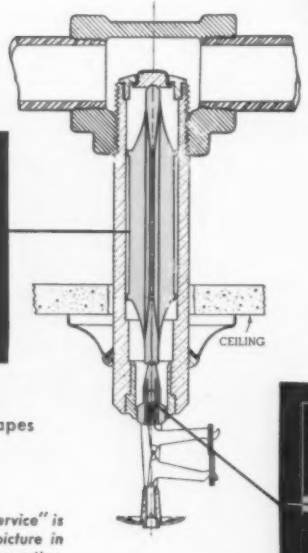
REVERE Extruded Shapes

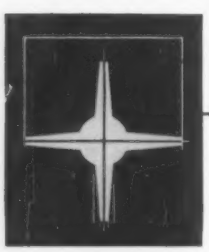
in dry pendent sprinkler heads lessen machining, save money

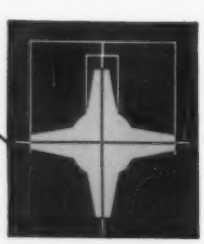
Some 16 years ago the Viking Corporation, Hastings, Michigan, decided to find a way to put sprinkler piping for dry pipe systems above the finished ceiling, leaving only the sprinkler heads visible. This meant designing a sprinkler head which would be free of water except when in use. Thus there would be no drainage problem, and no chance of freezing. The dry pendent sprinkler head as finally developed extends into the sprinkler pipe, where a bronze cap keeps the entire valve waterless. When a fire occurs the usual fusible element melts, two struts drop, releasing the cap and permitting water to flow.

In the original experimental work, the two struts were machined out of solid brass bar. This took time and involved the generation of a considerable amount of scrap, since each strut has four deep fins. Once the idea had proved itself, Viking came to Revere for extruded shapes, in order to save both machining and metal. So much time has elapsed since the original machining of the bar that comparative cost figures would be meaningless, but it is evident to Viking, and to everybody familiar with extruded shapes, that the saving is substantial.

Cross section of Viking Dry Pendent Sprinkler Head, and cutaway view







Outline of the two shapes supplied by Revere

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The Iron Age

SALUTES

E. Howard Perkins He began his career as a construction engineer but was lured away by the soft luster of magnesium. Now he is chairman of a leading nonferrous producing firm. His efforts have reached stratospheric heights.

Among hundreds of outstanding men in the nonferrous metalworking industry, the one who qualifies best for the title, "Mr. Magnesium," is E. Howard Perkins, president and board chairman of Brooks and Perkins, Inc. A born self-starter, he has more than a score of magnesium "firsts" to his credit.

He pioneered such projects as: the application of formed magnesium sheet assemblies for aircraft and electronics equipment; adaptation of magnesium plate to printing processes; hot drawing of such metals as titanium and zirconium; first commercial production of boral, a neutron shielding material. Perhaps one of his most unusual firsts occurred during the 1930's when he worked with Prof. Picard and the National Geographic Society in producing a magnesium gondola for the first balloon ascension into the stratosphere.

Latest of his long string of accomplishments is organization of the Alabama Metallurgical Corp., whose multi-million dollar plant at Selma, Ala., is scheduled for production of high-purity magnesium and calcium metals by the end of 1957.

Before he was lured by the glitter of magnesium, Howard Perkins got his start with steel—in the heavy construction field. Born in New York State, the son of a bridge builder, he went to work for his father after graduating from the College of Wooster, Wooster, O. His father's firm, Horse Head Bridge Co., was bought out by American Bridge Div. of U. S. Steel. In the early 1920's, while he was in charge of erecting the Bay City plant of Dow Chemical Co., young Howard saw the possibilities that lay ahead in magnesium production. When the plant was completed, Dow retained him as magnesium consultant, then made him plant superintendent.

A dozen years and millions of pounds of magnesium later, Howard Perkins went into business for himself. His company now is the second largest supplier of magnesium sheet.

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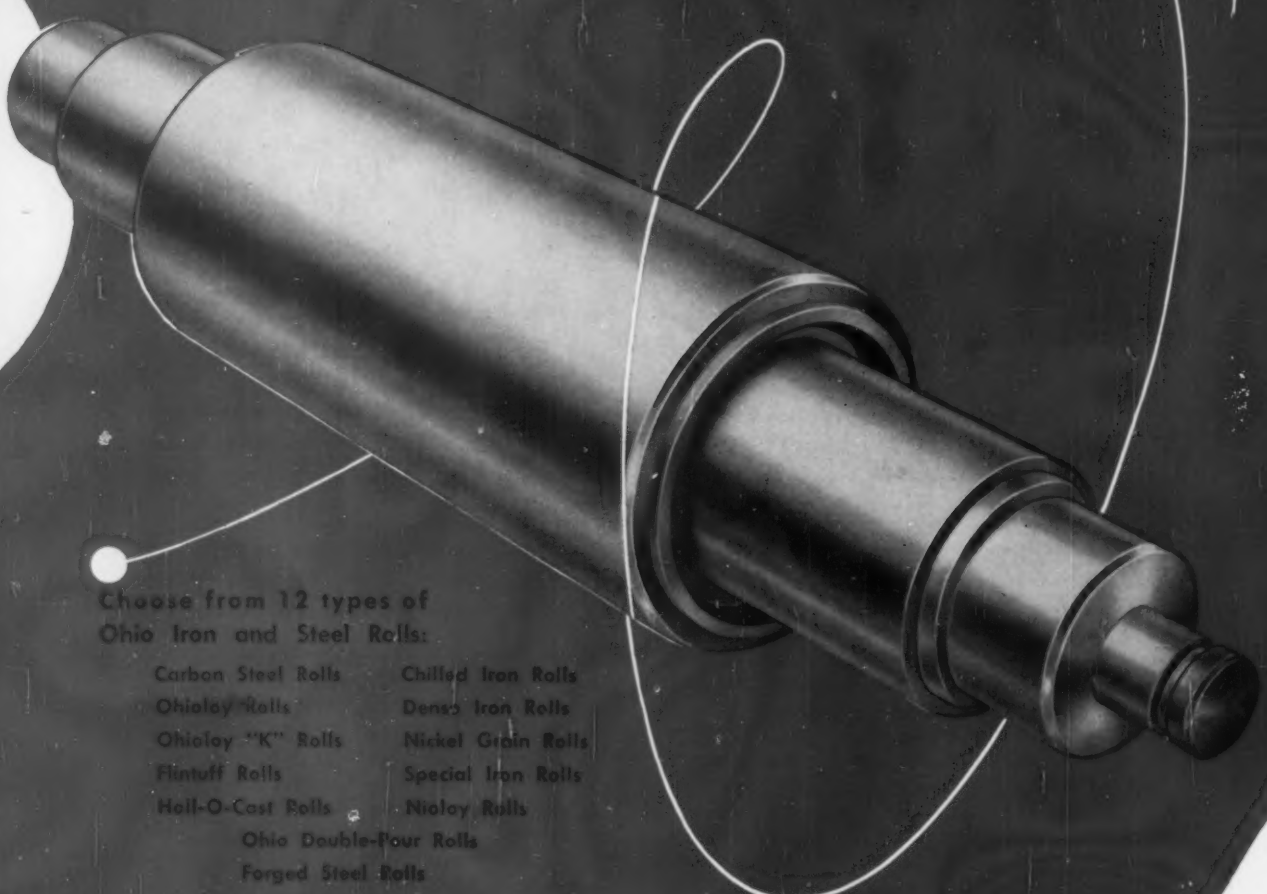
shaping metal for all industry



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ORI

The Iron Age INTRODUCES

V. H. Peterson, named vice president, engineering, **Fairbanks, Morse & Co.,** Chicago; **James G. Graham,** named general manager, railroad sales, Chicago; **Gordon Anderson, Jr.,** named asst. chief engineer; **William B. Morse,** named asst. to coordinator.

George W. Bretz, named asst. vice president, West Coast, **Air Products, Inc.,** Allentown, Pa.

John J. Kenny, elected asst. treasurer, **Crown Cork & Seal Co., Inc.**

H. J. Mauderer, named vice president and management representative, Caribbean area, **Westinghouse Electric International Co.,** New York.

S. J. Laudenslayer, appointed superintendent, No. 6 machine shop, **Bethlehem Steel Co.,** Bethlehem, Pa.

Robert W. Spacek, named superintendent, Peerless plant, **The Wellman Bronze & Aluminum Co.,** Cleveland.

W. W. Holloway, Jr., named superintendent, tube mills Benwood Works, **Wheeling Steel Corp.,** Benwood, W. Va.

Birnie V. Edridge, appointed controller, Henry Disston Div., **H. K. Porter Co., Inc.,** Philadelphia.

A. G. Warren, appointed regional sales manager, Syracuse, N. Y., office, **Baker Bros, Inc.,** Toledo, O.; **J. P. Nugent,** appointed regional sales manager, Dearborn, Mich., office.

James E. Good, named field sales manager, Atkins Saw Div., **Borg-Warner Corp.,** Indianapolis.

C. B. Pharo, Jr., appointed asst. district sales manager, **Republic Steel Corp.,** Birmingham.

Kenneth V. Knebel, named general manufacturing manager, New Departure Div., **General Motors Corp.,** Bristol, Conn.; **Donald C. Stewart,** named plant manager, Sandusky, O.

Earl V. Akerlow, appointed asst. division manager, Engineering Dept., **Kaiser Engineers,** Fontana, Calif.

Henry F. Bemmer, named general manager, Traffic Dept., **Great Lakes Steel Corp.,** Detroit; **H. W. Gibbs,** named manager.

Edward A. Kotnik, named training specialist, Metallurgical Products Dept., **General Electric Co.,** Detroit.

S. M. Ferguson, appointed district manager, Detroit, Elevator Div., **Westinghouse Electric Corp.**; **R. E. Ward,** named manager, New England, Elevator Div., Boston.

R. L. GRAY, elected president, Armco Steel Corp., Middletown, O.

W. W. SEBALD, elected vice chairman and chairman of executive committee, Armco Steel Corp., Middletown.

EDWARD J. SHAGES, elected vice president and manager, Cutting Tool and Gage Divisions, Pratt & Whitney Co., Inc., West Hartford, Conn.

CHESTER P. COLDREN, named manager, research and development, Reliance Div., Eaton Manufacturing Co., Massillon, O.

John J. Littley, named sales manager, hydraulic and compacting presses, Hamilton Div., **Baldwin-Lima-Hamilton Corp.,** Philadelphia; **Byron B. Belden,** named application engineer, compacting presses, Hamilton Div.

Following men have been promoted and assigned additional duties in the flat products group of **Inland Steel Co.'s** Indiana Harbor Works: **William C. Kostbade, Henry N. Schumacher, Rudolph P. Schuler, Emil R. McGaughey, Richard J. Peterson, Edward R. Reed, Sam Zatkoff** and **F. Lathrop Coombs.**

S. E. Gewin, named district manager, Chicago office, **The Bristol Co.,** Waterbury, Conn.; **Walter Messner,** named manager, St. Louis office.

Joe E. McQuaid, appointed manager, General Sales Dept., **Electric Steel Foundry Co.,** Portland, Ore.

U. R. Jaeger, appointed sales manager, roll-bond products, Western Brass Div., **Olin Mathieson Chemical Corp.,** New York.

Donald W. Walker, appointed foil product manager, **Kaiser Aluminum & Chemical Sales, Inc.,** Chicago.

H. J. Meany, appointed manager, Texas Div., **Norris-Thermador Corp.,** Waco, Tex.

Robert C. Fenton, Jr., and **Richard L. Noon,** named sales representatives, Stanley Pressed Metal, Div. of **The Stanley Works,** New Britain, Conn.

Chester A. Chamberlain, named asst. to president, **Diebold, Inc.,** Canton, O.

C. Lawrence Bulow, named sales manager, condenser and heat exchanger tubes, **Bridgeport Brass Co.,** Bridgeport, Conn.

WYNNE C. WALSTON, named contracting manager, Cleveland, American Bridge Div., U. S. Steel Corp.

WAID V. CLARK, elected treasurer, Thew Shovel Co., Lorain, O.

ROBERT A. COLE, appointed sales manager, The Cincinnati Gilbert Machine Tool Co., Cincinnati.

JOSEPH D. GAVIN, named manager, Sheet and Strip Order Dept., steel service plant, Joseph T. Ryerson & Son, Inc., Chicago.

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Where can you use this simple fastener?

If you use locating dowels, hinge pins, rivets, set screws —or straight, knurled, tapered or cotter type pins, Rollpin offers the opportunity of a better method that can cut assembly and maintenance costs. This slotted tubular steel pin with chamfered ends eliminates special machining, tapping, and the need for precision tolerances. Driven into a hole drilled to normal production standards, it locks securely in place, yet can readily be drifted out and reused whenever necessary.

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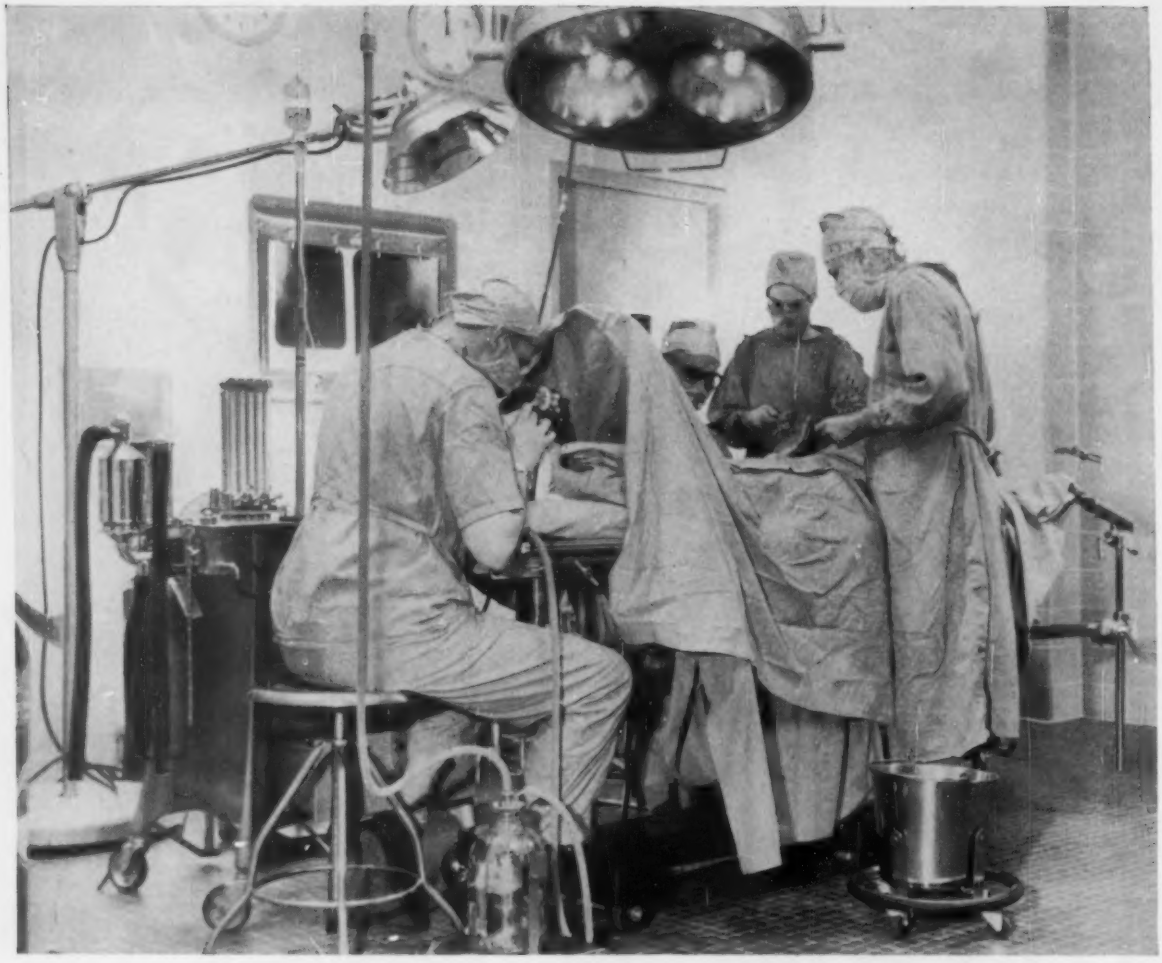

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PERSONNEL

Dan R. Lynch, named sales manager, **The Cleveland Cartage Co.,** Cleveland.

Martin J. Connolly, Jr., named asst. sales manager, headquarter sales, **Bound Brook Oil-Less Bearing Co.,** Bound Brook, N. J.

Harry L. Warner, named sales manager, Fabricating Div., **Kaiser Steel Corp.,** Fontana, Calif.

Charles L. Shanholtzer, appointed sales manager, steel-pride products, Sheet Metal Div., **Follansbee Steel Corp.,** Follansbee, W. Va.

Dr. Torben H. Meisling, named senior research engineer, Computer Lab., **Stanford Research Institute,** Menlo Park, Calif.

John S. Pettibone, named technical writer and research chemist and member, corrosion section, Bayonne Research Lab., **The International Nickel Co., Inc.,** Bayonne, N. J.

Andrew J. Sofranko, appointed sales engineer, **Mannesmann-Meer Engineering & Construction Co., Inc.**

Richard G. Lang, appointed sales representative, Chicago district, **Heppenstall Co.**

E. Ralph Egloff, named service engineer, Chicago sales office, **Acheson Colloids Co.,** Port Huron, Mich.; **Frank H. Mrozek,** named service engineer, New York office.

OBITUARIES

Marshall Lasher, 63, vice president of **Hubbard & Co.** and director of its Pacific Coast operation.

Fredrick W. Wagner, 41, vice president, **Wagner Bros., Inc.**

Henry A. Saller, asst. technical director, **Battelle Institute,** Columbus, O.

This is an actual photo of a surface prepared by polishing and etching a cross-section of a forging, to reveal the "grain flow." (x2)

A PICTURE OF ADVANTAGES YOU CAN GET ONLY FROM FORGINGS

In the picture above you see the grain flow in a forging.

This picture demonstrates two things. First, the metal is dense and free from porosity. The impact or pressure of forging helps make it so. Such density is important when parts must have machined surfaces, when they must provide reliable strength and safety, and when they must be tight against leakage of liquids or gases. This quality reduces rejects and saves money. It contributes to safety and saves lives.

Second, notice how grain flow lines follow the shape of the part. This improves impact resistance and fatigue strength of the part. In closed-die forging, these flow lines can be positioned, to give maximum properties where they are needed. As a result, forged parts can be lighter, safer, stronger, and frequently less costly.

Thus this picture shows you why forged metal is *metal you can trust.* You can trust forgings for performance, and to save money. Find out how forgings can improve your products, your costs. Consult a *Forging Engineer,* and send for the booklets offered below.

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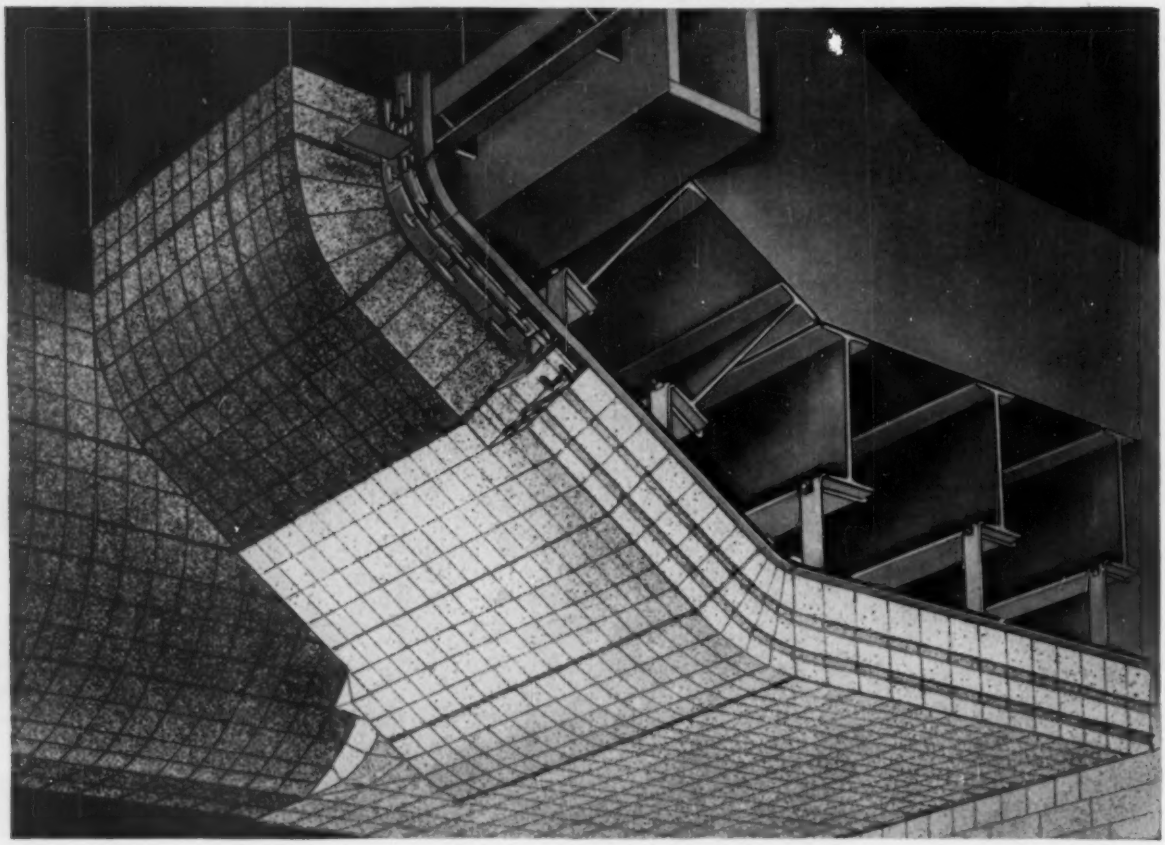
New trends in the use of refractories



LACLEDE-CHRISTY develops new arch for metallurgical furnaces

This new furnace arch design saves installation time, saves money and features adaptability never before achieved with refractory arch construction.

The Laclede interchangeable type arch proved its money and time-saving value by more than one year heavy duty steel mill service. Service records show from 850 to 1000-heat campaigns. It is particularly suited for fantail and chill arches in open hearth furnaces, and heating zone arches in reheating furnaces as well as copper reverberatory furnace arches.

Basic tile or clay tile may be hung interchangeably on the supporting structure, as service experience requires. The design permits adequate expansion of tile during heating up and continued furnace service. Minimum number of tile shapes are required.

Lug castings engage the tile on the bed joints, allowing easy installation. Heavy shelf castings prevent cumulative overload.

Money-saving performance can be expected when this interchangeable type arch is built with Laclede's Peerlac refractory (60% alumina) in 12 in. and 15 in. depths, and with basic refractory steel encased. Supporting structure of steel weldments and small heat-resisting castings are also available for prompt shipment.

This example of Laclede advancements in refractory service demonstrates one more point: it pays to make Laclede-Christy your first refractory source.

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FEATURE ARTICLES

Cuts oil costs—

Ultrasonic Quenching: It's New, More Effective

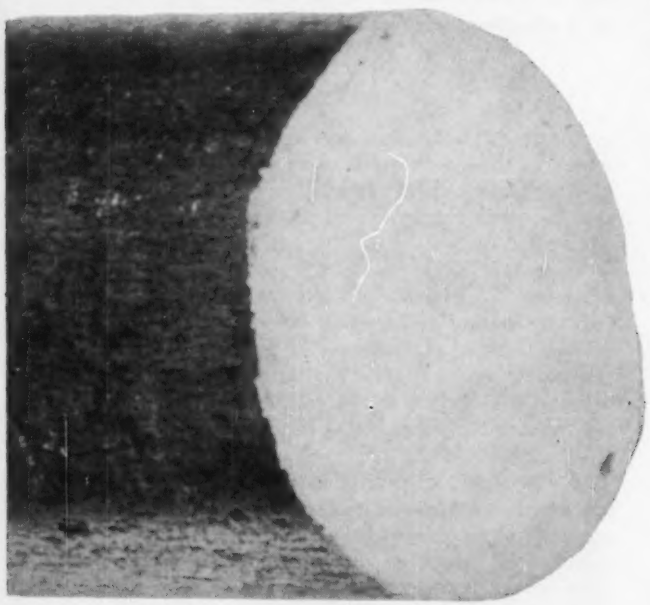


FIG. 1—Cylinder at bottom has 60 to 90 pct less scale due to ultrasonic quench agitation.

◆ Definitely different, remarkably efficient—ultrasonic quenching actually provides hardnesses that are higher . . . No amount of quench oil agitation can produce the same quenching effectiveness.

◆ The reason: ultrasonics sends vibratory waves through the quenching medium . . . These vibrations instantly break down the vapor phase surrounding the hot part, guarantee more efficient cooling.

By T. J. BULAT,
Pioneer-Central Div.,
Bendix Aviation Corp., Davenport, Iowa

◆ AS EVERY heat treater knows, an agitated oil quench is far more effective than still oil. Now add to this common knowledge a brand new development—the addition of ultrasonic energy. Recent tests prove that, in combination with agitation, ultrasonics provides even less expensive oils with the ultimate in quenching effectiveness.

Surprisingly enough, the advantages of "ultrasonic quenching" are not limited simply to the provision of a more effective means of cooling. There are other equally important advantages—less part distortion, less oil drag-out, less heat

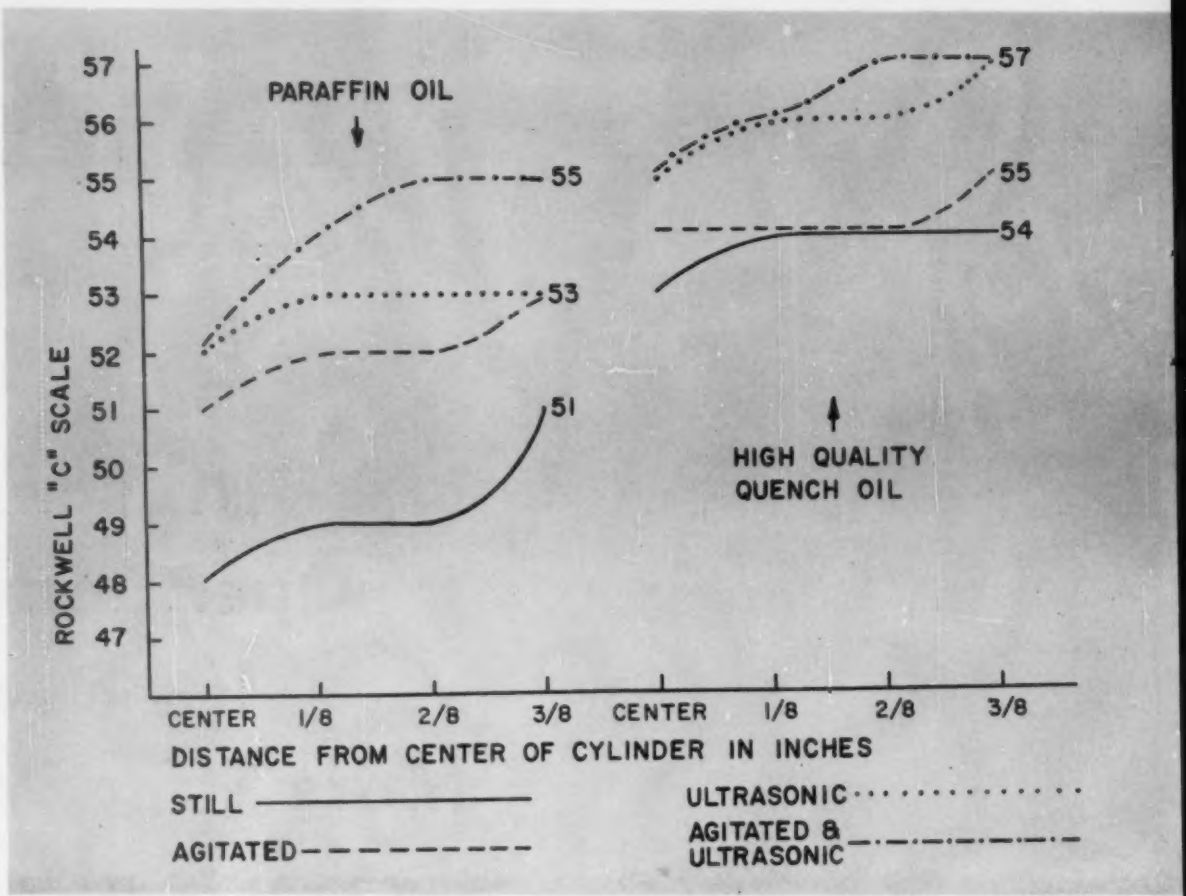


FIG. 2—Chart shows that a less expensive paraffin oil is effective quench with ultrasonics.

treat scale on parts after quenching.

Add to this the fact that ultrasonic quenching can, in some instances, permit the use of lower cost quenching oils without sacrifice of heat treat quality. The net results are highly impressive both metallurgically and in terms of dollar-and-cents economy.

Ultrasonics turns the trick by imparting vibratory waves directly to the quenching medium. These vibrations, in turn, produce the mechanical breakdown of the vapor phase inherent in quenching.

Breaks vapor blanket

The blanket of vapor which normally forms around a hot steel part immersed in quenching cil (and which actually retards quenching action) is swiftly and uniformly dissipated. As a result, the part is continuously exposed to a fresh supply of cooling oil, thus guaranteeing rapid and uniform quenching action.

The ultrasonic system required is relatively simple. It consists of a generator and a low frequency, magnetostrictive transducer. The generator feeds electrical energy to the transducer which, in turn, converts it to mechanical energy. The mechanical energy in the form of vibrations can be readily transmitted to a container of quenching oil.

Vibrations thus produced cause the oil to cavitate. Thousands of implosions (bubbles bursting *inward* rather than *outward*) generate several hundred atmospheres of pressure in the quenching medium. The cavitational force exerted at the surface of the part during quenching reduces the vapor phase instantaneously.

In addition to the improved cooling achieved with the help of cavitational action, several other points are of practical importance. Parts quenched ultrasonically have less heat treat scale than those quenched in conventional baths. Drag-out or carry-over of oil is signficantly reduced. There is some evidence that grain refinement is promoted by ultrasonic quenching.

To demonstrate the effects of ultrasonic quenching, a group of controlled experiments was performed. For purposes of comparison, quenching was done in two types of quenching

TABLE I

Rockwell C Hardness Values: SAE 8740

Distance from Center	Still	Agitated	Ultrasonic	Ultrasonic Agitation
Paraffin Oil				
Center	48*	51	52	52
1/8 inch	49	52	53	54.5
1/4 inch	49	52	53	55
3/8 inch	51	53	53	56
Quenching Oil				
Center	53	54	55	55
1/8 inch	54	54	56	56
1/4 inch	54	43	56	5
3/8 inch	54	55	57	57

TABLE II

Rockwell C Hardness Values: SAE 1095

Mineral Oil		High Quality Quenching Oil	
Still	Ultrasonic	Still	Ultrasonic
38*	49	51	58
31	48	51	58
36	50	53	60
29	48	54	59
30	48	54	59
31	50	53	59
33	49	54	59

oil and under several different conditions.

Metal cylinders, 1 in. diam and 1 in. long, were cut from 8740 steel barstock. These were held for 1 hour at 1475°F in an electric resistance-type furnace. The cylinders were then immersed in a paraffin oil and in a high-grade quenching oil.

Quench baths, each containing one gallon of oil at 72°F, were of four types: 1) still, 2) mechanically agitated, 3) ultrasonically agitated, and 4) ultrasonically *and* mechanically. The starting temperature of the bath was constant for each cylinder tested.

Produces higher hardness

After 10 minutes in the quenching bath, the steel cylinders were removed and cross-sectioned. Hardness tests, using the Rockwell C scale, were made along a radius of the exposed face. When the cylinders were taken from the baths, the amount of scale present was observed and the oil drag-out was measured.

Hardness results of these tests are listed in Table I and plotted in Fig. 2. They show that there is an increase in hardness resulting from ultrasonic agitation that is not gained by conventional quenching methods. This is especially noticeable when using paraffin oil.

Parts quenched in high-grade quenching oil also show a definite increase in hardness when ultrasonically quenched. This increase is relatively small and its economic significance is probably limited. The significant factor is that the same hardness or better can be obtained with an inexpensive oil ultrasonically agitated as can be obtained with an expensive oil either still or mechanically agitated.

Cylinders quenched in still oil and in ultrasonically agitated oil are shown in Fig. 1. It is estimated that about 60 to 90 pct more scale was removed from the cylinder submerged in an ultrasonic quench.

When the test cylinders were removed from the various oil baths, the amount of oil adhering to each cylinder was measured. Those removed from a still bath carried away an average of 11.1 grams of oil. Those removed from an ultrasonically activated bath carried away an average of only 5.8 grams of oil. Thus ultrasonic quenching can provide savings in oil drag-out of as much as 48 pct.

Promotes heat treat uniformity

Similar cylinders of 1095 steel were heated for one hour at 1550°F in a Lindberg atmosphere furnace. These cylinders were quenched in oil baths identical to those used for the 8740 specimens. After quenching, hardness tests were made at 1/8 in. intervals along the length of the outer diameter in order to determine the uniformity of hardening.

Results of these hardness tests are given in Table II. They show that ultrasonic quenching definitely gives a more uniform hardness along the length of a heat treated part.

For purposes of comparison, other tests were run with brine and water as the quenching media. Other alloys were also tried. In all cases, results were comparable to those obtained for the two initial steels.

The ultrasonic transducer used for these tests was a Bendix UC-12 magnetostrictive unit with a power output of 2 kw at operating frequencies of 15 to 20 kc. This unit is capable of agitating 6 gallons of oil so that it could be used for production parts as well as test pieces.

Most important, ultrasonic quenching is definitely not restricted to the laboratory. There are now available units that can completely activate up to 40 gallons of liquid medium and it is expected that this capacity will be increased in the near future.

■ *Reprints of this article are available as long as the supply lasts. You may obtain a copy from Readers Service Dept.,* THE IRON AGE, *Chestnut & 56th Sts., Philadelphia 39, Pa.*

Shows lead-bearing phases—

New Etch Spots Leaded Steels

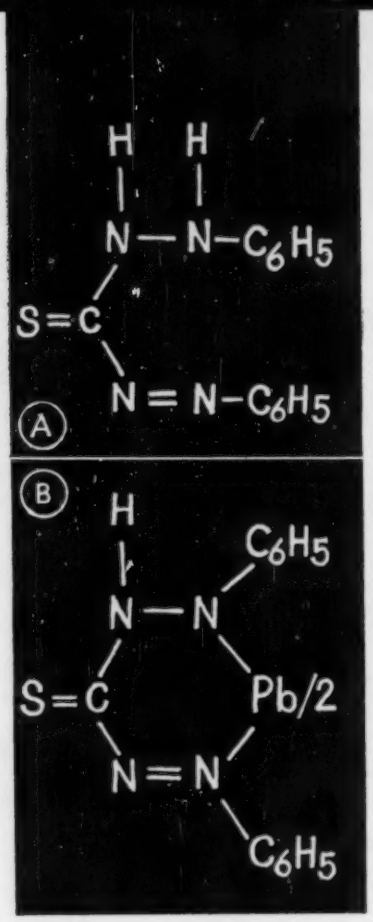


Fig. 1—Dithizone (A) reacts with lead to precipitate red inner complex lead compound (B).

◆ With the ever-widening use of leaded steels, the need for a satisfactory etching technique for spotting lead-bearing constituents has grown by leaps and bounds.

◆ Here—finally—is the answer . . . Using relatively simple reagents, this etching technique lends a consistent identifying color to leaded microconstituents . . . Essential as a research tool, it may also prove valuable in sorting mixed stock.

By: A. E. GERDS,
Assistant Division Consultant,
and C. W. MELTON,
Principal Microscopist,
Battelle Memorial Institute,
Columbus, O.

◆ LEADED STEELS have been growing in popularity principally because of their improved machinability. Until recently, little was known of the mechanism responsible for this improvement.

Another significant gap in our knowledge of these steels was due to the lack of a satisfactory technique for revealing lead-bearing phases in their microstructures. This problem has now been solved in the course of a research program conducted at Battelle Memorial Institute, Columbus, O., and sponsored by Republic Steel Corp.

Simply stated, the problem involved finding a chemical reaction with lead that would result in an adherent stain on the lead-rich phases in the polished and etched surfaces of steel specimens. The staining reagent had to be specific for lead to the extent that no other constituents of the steel would react with it to mask the staining reaction.

Part of the problem was to obtain a high degree of resolution. To do this, it was desirable that the reaction produce a precipitate which would not migrate laterally as would a soluble reaction product.

A staining method based on a lead-printing technique was found to be satisfactory. The lead printing technique was described by B. S. Evans more than a decade ago.

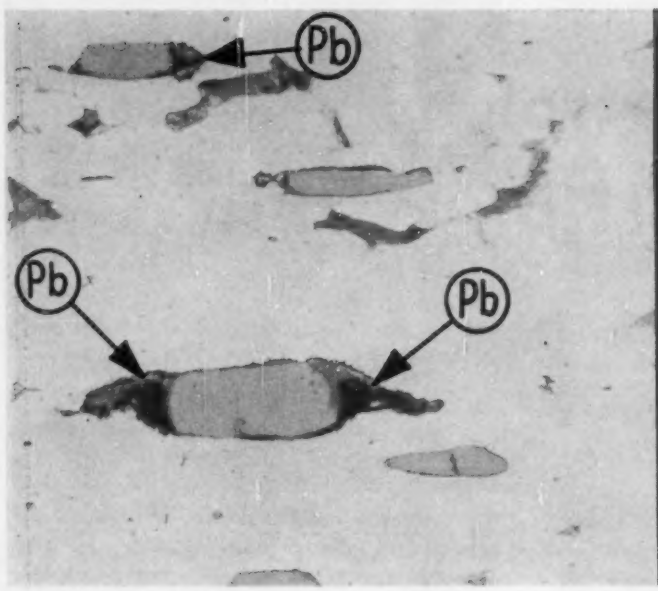


Fig. 2—Sulphides in leaded steel are enveloped by reddish lead-bearing constituent (arrows).

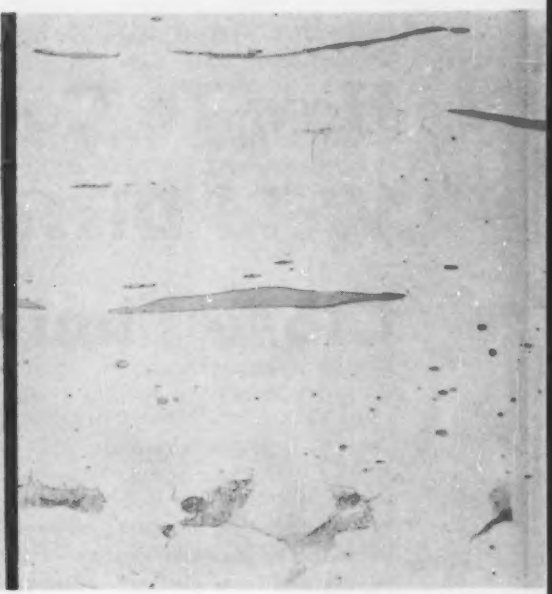


Fig. 3—Nonleaded steel is free of red staining envelopes surrounding the sulphide inclusions.

The new staining method requires a metallographically polished specimen. The specimen is etched with 4 pct picral, rinsed in running water, and dried before applying the staining reagent.

The specimen is then swabbed for about one minute with the staining reagent which is a mixture of the following solutions: (a) 1 g of KCN in 100 ml of H_2O and, (b) 0.25 g diphenylthiocarbazone (dithizone) dissolved in 10 ml of chloroform. The solutions should be mixed vigorously before the specimen is swabbed.

Etch forms lead compound

The reaction can be explained diagrammatically. The dithizone (A) reacts with the lead to precipitate a brick-red inner complex lead compound (B) outlined in Fig. 1.

In some initial experiments in which lead chromate was formed on the lead-bearing phases before the staining reagent was applied, the resulting red stain was increased both in volume and visibility. In each instance, the lead chromate tended to migrate from the lead rich inclusions. This resulted in greatly reducing the resolution of the method.

Without the aid of the intermediate lead chromate, the red stain on the lead-rich inclusions could not be detected with bright field illumination. The lead-bearing phases could be readily detected with either polarized light or dark field illumination with the Leitz Ultropak. Under these conditions, the resolution was limited only by the resolving power of the microscope used.

Since it was not feasible to reproduce color prints, black and white photomicrographs, taken with bright field illumination, are compared in Figs. 2 and 3.

Dark patches of pearlite lie in grain boundaries in both figures. The sulphide inclusions are the solid gray stringers. Some of the sulphides in the leaded steel (Fig. 2) are enveloped by the lead-bearing material (indicated by arrow) which stains red. Some isolated, random, lead-bearing inclusions also were noted in this steel.

The non-lead steel is characterized by an absence of these envelopes as is shown in Fig. 3. In addition, no isolated lead-bearing inclusions are evident.

The lead-printing method has been useful for years in determining segregation of lead in steels on a macro-scale. The newly developed technique now makes it possible to study the relationship of the lead-bearing phases to the other microconstituents in steel. In some instances, it may also prove to be a very useful method for sorting mixed steels.

Watch residual stresses—

How To Control Weld Distortion Within Close Limits

◆ Weld distortion, always a problem, can be predicted and controlled within close limits . . . Achieving this calls for a thorough understanding of the forces causing distortion.

◆ It focuses on residual stresses, and how to first predict, then influence them favorably . . . Treat distortion as a production floor problem capable of control.

By JOHN MIKULAK,
Assistant to the Vice President, Manufacturing,
Worthington Corp., Harrison, N. J.

◆ WORKPIECE distortion in welding is inescapable. Each weldment poses distortion problems peculiar to its own individual design. Even so, thorough grounding in the basics of weld distortion makes possible its accurate prediction and precise control.

Consider a several hundred pound bolster center filler for the bed of a stamping press. Welders hold shop tolerances on bolster width to plus 0.00 in., minus 1/16 in. Surfaces remain parallel in both vertical and horizontal planes within close limits. One saving consequence of such tolerances: chip loss in machining the weld-fabricated part averages 5½ lb, versus need for milling 115 lb of chips from the earlier design, a casting.

Before considering ways of controlling distortion, look again at what causes it. Essentially, distortion results from unbalanced thermal forces that upset the material dimensionally. Such stresses may manifest themselves before, during or after the welding operation.

Distortion occurring in welding may be (1) minimized by proper selection of material, joint design and weld technique, (2) restrained somewhat by jigs or jigging positioners, though this can increase stress levels, and/or (3) reduced by postweld heat treatment, often accompanied by counter-stressing under load.

Properties of the material directly influencing distortion include: (1) thermal capacity, (2) thermal conductivity, and (3) yield point or proportional limit value, The effect of each varies with weld joint design and joining technique.

Watch residual stresses

Some metals, such as cast iron, will not endure high stresses. These materials can crack during or immediately after welding. On the other hand, many ductile steels will absorb considerable thermal energy on heating. As they do this, stresses build up beyond the metals' proportional limits and show themselves as distortion. Residual stress, permanent distortion or both may exist after recooling to room temperature. If cooling is rapid, presence of residuals or distortion is almost certain.

In joining metals of unequal thermal capacity, considerable temperature differential can appear between one member and another. Under such

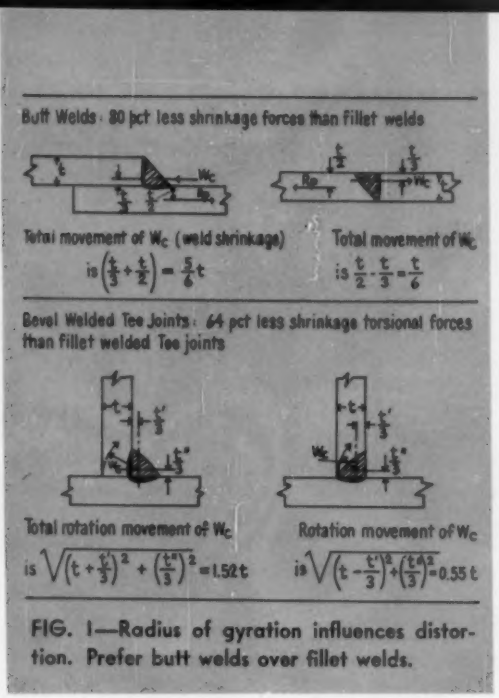

Butt Welds - 80 pct less shrinkage forces than fillet welds
Total movement of Wc (weld shrinkage) is $\left(\frac{t}{3}+\frac{t}{2}\right)=\frac{5}{6}t$
Total movement of Wc is $\frac{t}{2}-\frac{t}{3}=\frac{t}{6}$
Bevel Welded Tee Joints - 64 pct less shrinkage torsional forces than fillet welded Tee joints
Total rotation movement of Wc is $\sqrt{\left(t+\frac{t'}{3}\right)^2+\left(\frac{t''}{3}\right)^2}=1.52t$
Rotation movement of Wc is $\sqrt{\left(t-\frac{t'}{3}\right)^2+\left(\frac{t+3}{3}\right)^2}=0.55t$

FIG. 1—Radius of gyration influences distortion. Prefer butt welds over fillet welds.

circumstances, unbalanced thermal forces thus introduced can lead to distortion.

Even in the same material, point source of heat can bring about sizeable temperature gradients. A temperature differential of only 160°F along 1-in. of an openhearth steel plate will create unbalanced thermal forces exceeding 30.-000 psi. This 160°F temperature gradient can easily occur in welding. Unless relieved, such a force can cause severe distortion.

Heat distribution in and around a welded joint depends on the material's thermal capacity, its thermal conductivity and welding technique. In ¼-in. steel stock brought to welding temperature, the plate area heated between 600° and 1000°F is nine times greater than on a 4-in. plate heated in similar fashion. The amount of distortion varies almost proportionately with the heat input unless special steps can reduce plate movement.

To control weld distortion, provide proper control of the various elements influencing distortion. (See the accompanying box for a list of major factors.)

For the shop, this means standard procedures, and implies use of automatic or semiautomatic welding wherever feasible. The aim is to level out individual variations in the welding job to allow prediction of distortion, both in magnitude and direction. On reaching that stage, then add other factors to reduce and more precisely control distortion.

The designer can do much to control distortion. First, by designing the structure to enable selection of proper joints. Second, by reducing the number of welds, hence the number of times for introducing unbalanced thermal forces. Third, by minimizing size of welds, and so lessening the magnitude of weld-induced stresses. Fourth, by making use of subassemblies, particularly where one or more surfaces must register. Lastly, by designing where possible so most welding takes place near the radius of gyration of the structure or subassembly (Fig. 1).

In a typical procedure standard, departments of engineering, inspection, shop production and cost estimating all have standard data encouraging uniform results. The designer selects the joint which will give the best service, and the production people build the procedures around the final design. The role of the shop in standardized procedures involves not only distortion control, but also reduction of costs required to achieve this.

Outline weld sequence

Procedure control can be simple or elaborate. At times, it may consist merely of a sketch with weld sizes, their location, and an outline of the sequence in welding joints.

For more accurate distortion control, specify the type of welding process and welding speed, plus additional details as to welding direction. In one shop case history, just this supplemental information helped eliminate a straightening operation following weld-fabrication of a positioner table top.

Without a procedure and using the skip-weld technique with the manual arc process, buckling of the table top ran between ⅜ and ⅝ in. Each table then required straightening. Operators now hold distortion to less than ⅛-in. bow, and within 1/16-in. bow on most table tops.

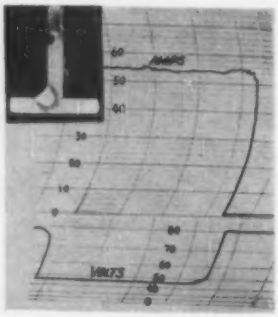
Next step in procedure complexity introduces inspection, material and heat treating controls. Shop standards at this point usually outline specifically what each step in the weld operation accomplishes.

At this level of procedure standardization, there's need for controlling residual stress. Establishing maximum permissible levels of residual stress in parts both before and after welding enables further distortion control.

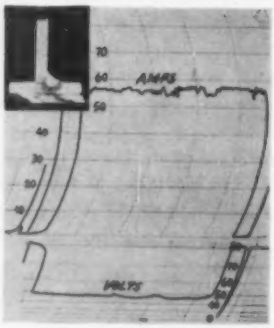
Stress relieving prior to welding can effectively reduce peak values of mill residuals, or

To Control Weld Distortion, Employ—

Automatic or semiautomatic weld setups ▪ Higher weld speeds ▪ Lower heat input ▪ Deep penetration on fillet welds ▪ Depositing less weld metal ▪ Butt joints over fillet joints ▪ Good fitup ▪ Welds near radius of gyration ▪ Short welds ▪ Welds to a locked-up corner (less distortion but higher residual stresses) ▪ Uniform stock thickness ▪ Stock with low residual mill stresses ▪ Use of welding positioner ▪



Root $\frac{1}{32}$ - H_m = $\frac{7}{16}$ - V_m = $\frac{11}{32}$ - T_c = $\frac{31}{64}$ - T_w = $\frac{1}{4}$ - T_f = $\frac{18}{64}$ in.



Root $\frac{3}{32}$ - H_m = $\frac{17}{32}$ - V_m = $\frac{13}{32}$ - T_c = $\frac{5}{16}$ - T_w = $\frac{1}{4}$ - T_p = $\frac{1}{16}$ in. (All fractional dimensions given in inches)

FIG. 2—Recording ammeter - voltmeter generally indicates depth of weld penetration.

stresses introduced in earlier fabrication operations. Stress relief may include stress-loading parts while in the furnace. On heating, properly positioned weights cause plastic flow and creep of the workpiece in locations of undesired bow. Properly executed, distortion can often be reduced to almost negligible values.

In employing this technique, provide sufficient support to overcome localized upset and to hold plastic flow within limits. Furnace temperature for ductile steels should fall between 1200° and 1300°F. Soak time should run about 1½ hours per inch of workpiece thickness.

In stress relieving under load, lack of sufficient weight on workpiece is a common failing. With such a material as SAE 1020 low carbon steel, strength at 1300°F still averages one-third that at room temperature. At times, loads in this shop have exceeded 36,000 lb to bring locally distorted areas back to shape.

Depositing less weld metal at the joint offers another approach to reduction of weld distortion. This because less weld metal means lower heat input, and so lower stress levels. One way of achieving this without reduction of joint strength asks for greater depth of weld penetration.

It's generally understood that the dimensional ratio of fillet weld leg to throat depth of weld should average about 1: 0.707. A series of more than 300 tests indicate, however, that depth of weld penetration (T_e) runs considerably more than throat depth (T_w). Throughout the series, ratio of minimum leg length to depth of penetration was above 1:1. Penetration depth can be considered more significant than throat depth in determining strength of the welded joint.

By calculating joint strength on the basis of penetration depth (T_e) rather than throat depth (T_w), a conservative design still results. Yet by so doing, amount of weld metal deposited may be reduced approximately 50 pct.

Detect weld penetration

One factor seemingly has restrained wider use of this approach to calculating joint strength: lack of production-type controls for inspecting depth of penetration. A simple technique exists for determining the general pattern of weld penetration.

The electrical circuit of a semiautomatic or automatic arc welder incorporates a recording ammeter and voltmeter. On welding a test specimen, the instrument supplies a corresponding record. A series of 200 recordings has established a correlation between the individual graphs and depth of penetration revealed by the cross sections of the corresponding weld test specimens.

A smooth, thin line indicates comparable stability of voltage or amperage curves. Fluctuation of these curves from the current or voltage norm shows up as jagged and/or heavy lines.

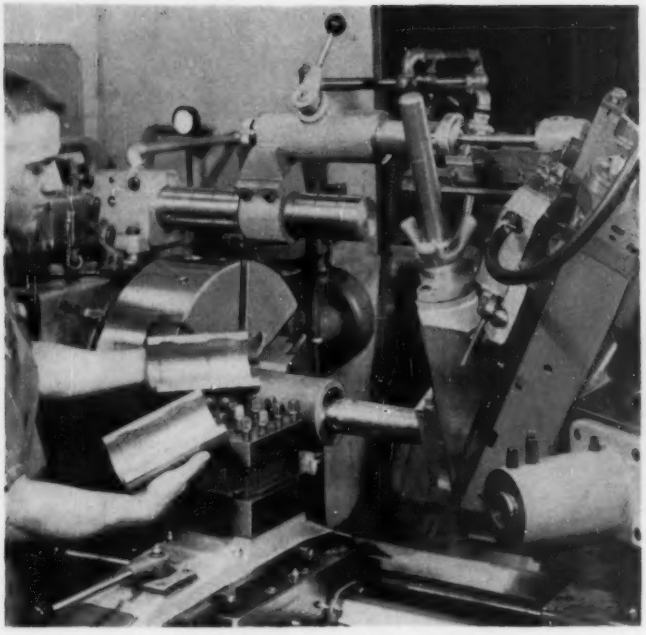
Note the correlation in Fig. 2 between the relatively constant voltage and amperage, and the depth of weld penetration displayed in the adjacent test specimen. This corresponds to maximum penetration, through the weld root to a depth dimensionally greater than the minimum leg size of the fillet joint weld metal.

Considerable raggedness in profile of the amperage curve can be interpreted as high frequency variations in the current. Such fluctuations may come about through directing the arc into the molten arc pool. Varying amperage also may occur from poor fitup or improper weld position.

Poorer depth of weld penetration results from these fluctuations. In Fig 2, accompanying calculations demonstrate that the weld penetrates about as deep as the length of the minimum fillet weld leg size.

Automatic or semiautomatic welding equipment simplifies the use of high current densities, which help bring about deep penetration. Results of tests verify this point.

Turret Lathe Attachment Cuts Complex Contours



TEMPLATE-CONTROLLED machining of complex contours proceeds accurately with new slide tool.

◆ FAST, accurate internal contour-boring of complex shapes is the report on a new slide tool attachment for turret lathes. Hydraulically-controlled, it's also intended for large diameter contour turning.

Engineered for heavy-duty, saddle-type turret lathes, the contouring tool mounts on any face of many lathe hexagonal turrets. As installed, it protrudes at 60° to the centerline of the spindle. The tool, complete with template and template holder, indexes with the turret. This helps avoid interference with other tooling mounted on adjacent turret faces.

The builder, Warner & Swasey Co., Cleveland, claims the contouring attachment plus simple, inexpensive tooling can machine contours involving curves, tapers, radii and even square shoulders. It fits in with both small and large lot production because of its comparably short set-up time.

A large, direct-acting hydraulic cylinder actuates the tool's tracer slide. The long stroke of the cylinder piston provides cutter travel up to 4 in. This allows machining of contours varying in diameter up to 8 in.

The tracer slide responds to a differential pressure, closed-circuit hydraulic system regulated by a sensitive stylus-controlled valve. Stylus pivots on a flexure-type hinge that helps hold down lost motion in operation. Thin strips of spring steel act as the pivot point, rather than the pins more frequently used.

The template and template holder mount and slide on a scraped way positioned away from chip-cutting area. This helps lower chances of malfunctioning due to dirt and chips.

A standard overhead pilot bar fitted with a bayonet lock eases the job of positioning the longitudinal template accurately. On indexing the mounted tool into position, the bayonet lock allows traversing rapidly to the point selected for start of the contour cut. Rapid tool approach with automatic lockup on reaching correct position lessens handling time between adjacent tooling stations.

Tool clears easily

Following the machining operation, the operator clears the cutting tool by flipping a cylinder return lever. An adjustable stop block prevents accidental contact between tool and opposite side of workpiece. This last can be significant in machining small diameter bores.

The tool holding block adjusts accurately over a vertical range of 10¼ in. to permit contouring workpieces of widely varying diameters.

Tracing action can be controlled in both directions by adding a dual template. With a 2-cutter bar mounted in the tool holder, an optional setup allows the attachment to contour bore both on feeding in and out. It's possible this way to completely machine all surfaces in a complex bore without changing the tool setup.

The attachment is designed so the operator may perform regular turret work without demounting the tool.

JOINT blending and surface polishing may both be handled at once with rubberized abrasives.

VARIOUSLY sized wheels spin at conventional grinding speeds, fit unusual workpiece contours.

Grind, buff or lap—

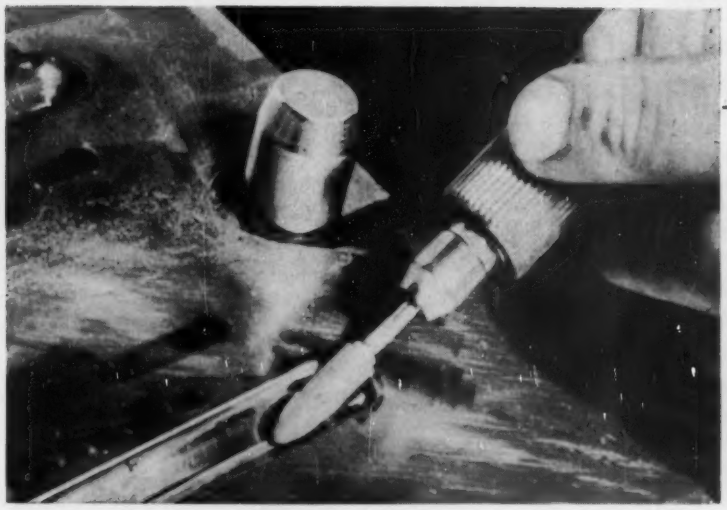
Rubber-Bonded Abrasives Give New Bounce To Finishing

◆ Available in four grits and a variety of sizes and shapes, rubberized abrasives help solve many special finishing problems . . . They offer advantages, too, in production finishing . . . No wheel dressing is only one such benefit.

◆ The abrasive-rubber blend cuts or polishes without digging in, tearing or drawing even the softest metals . . . It's unaffected by water or coolants and there's no time lost reloading wheels with fresh abrasive.

◆ RUBBER-BONDED abrasives can cut down the high cost and number of problems with finicky polishing, buffing and lapping jobs. Better known in their guise of grinding, cutoff and snagging wheels, they're proving equally effective in cutting corners on everyday production jobs.

Advantages reported from the shop include: (1) virtual elimination of wheel dressing, (2) uniform abrasive action throughout wheel life, (3) cuts or polishes even soft metals without digging in, tearing or drawing under heavy or light pressures, (4) usable right down to the wheel stub, (5) unaffected by water or other



Rubber-Bonded Abrasives For:

- Polishing
- Buffing
- Cleaning
- Blending
- Lapping
- Trimming
- Grinding
- Cutting
- Damaskeening
- Sharpening
- Deburring

DEEP pits, scratches and burrs smooth rapidly with silicon carbide-bearing rubber wheel.

coolants, (6) no production time lost reloading wheel with fresh abrasive or buffing compound.

Over the recent past, rubberized abrasives have piled up a sizable number of successful case histories. A typical list embraces almost every standard wheel finishing technique from grinding to lapping.

More than a few times, rubber-matrix wheels finish in one operation what previously took two. Deburring and polishing tops of aluminum alloy pistons, for example, at one time called for a hand filing job followed by buffing. Rubberized abrasive cones and points now do the job in one operation, and save at least 50 pct in labor time into the bargain.

Choose from various grits, shapes

Each of four grit types can be had in wheel form up to 8 in. diam and 1 in. thick. Other shapes available include cylinders, blocks, sticks, cones and points, as well as special designs.

All grits perform most efficiently at normal grinding speeds. Maximum surface speed recommended is 5500 sfpm. Motor speeds as low as 1700 are said to produce excellent results. Speeds up to 20,000 rpm have been used, but generally do not offer any significant advantage, according to Cratex Mfg. Co., San Francisco, makers of the wheels.

The abrasive embedded in the rubber matrix is silicon carbide. Cushioning action or rubber helps hold normal fracturing of the brittle carbide crystals to an efficient level. This means just fast enough to maintain good cutting action, but sufficiently slow to continuously present a fully abrasive surface as the rubber wears down.

In production finishing, a steady, light pressure seems to work best. This overcomes resiliency of the rubber matrix, and brings the abrasive into full contact with the workpiece. Softer metals need a lighter pressure. Harder metals call for heavier pressures than normal.

Water or other coolants may be used where necessary. Wheels have been found resistant to oxidation, heat, moisture, many chemicals and cleaners, sunlight and aging. Five years' service reported by some evidently results in no noticeable physical or chemical changes.

Rubberized abrasive wheels assume workpiece contour without difficulty. In shaping or trueing, start from the highest point on the wheel face. Hold the dressing tool at an angle slightly elevated to the wheel face, and rest it on a steady support. Take light cuts until the wheel assumes proper shape.

Redressing normally is unnecessary. Rubberized abrasives resist loading, gumming or filling. This because the rubber matrix can be considered relatively nonporous. It wears away at a steady rate, constantly exposing fresh cutting edges.

Cushioning effect of the rubber largely avoids tearing and drawing of the workpiece surface. The pressure-molded blend of rubber and silicon carbide is tempered and seasoned to a firm, tough, yet slightly resilient texture.

Coarse rubberized abrasive is intended for removal of burrs, pits and deep scratches. It's reported to cut rapidly without wheel clogging. On aluminum, brass, copper and similar soft metals, wheels grind without tearing or digging in. It leaves a relatively smooth surface on harder metals.

In several foundries, coarse grit wheels grind

"Firearms maker eliminated rejects, cut finishing time 25 pct with rubberized abrasives . . ."

flashing from brass, bronze and aluminum castings. Later the same wheels may clean and polish aluminum and cast iron core boxes. In the first instance, lack of sufficiently precise control of metal removal posed a problem with previously used grinding wheels. This plus extra steps needed to prepare castings for plating tanks brought about the switch to rubberized abrasives.

The core box situation involved several difficulties: First, the need to remove pits and scratches. Then followed a required polishing operation so the core box would slide off the sand easily. Emery disks followed by manually applied emery cloth answered the problem earlier, but involved a good deal of labor.

Coarse grit rubber-bonded wheels now remove pits and scratches from core boxes. Medium grit wheels 1 in. diam polish at speeds up to 10,000 rpm. Final surface is understood to be smoother than that of the original. Production life of core box is reported lengthened substantially.

In another type of operation entirely, coarse grit wheels readily clean paint, plastisols and other organic coatings from metal surfaces. Gimmick here is lack of wheel loading. Coated abrasives and grinding wheels used earlier did the job well, but tended to lose cutting ability due to clogging.

Mounted on an air grinder operating at 10,000 rpm, a rubber-bonded abrasive cone removes the plastic coating and simultaneously polishes the undersurface, ready for etching of part serial numbers. Cone is 1¾ in. long by 15/16 in. diam. Coolant is unnecessary.

Polishes soft and hard metals

Light grinding, deburring and general metal finishing calls for a medium grit rubberized wheel. Designed to strike a balance between rough grinding and final polishing, this grit size is recommended after rough stoning of both soft and hard metals. Final surface is reported smooth and free from scratches and tool marks.

One firearms maker has practically eliminated rejects in removing cutter and tool marks from gun parts of heat treated SAE 4140 chromium-molybdenum alloy steel. With 4-in. diam coarse and medium grit wheels, finishing time to a high polish has dropped 25 pct.

An automotive parts firm finds medium and fine grit rubberized wheels save impressively in time and material required to salvage carbide cutting tools. Metal buildup on tool edge was removed earlier in various ways. All proved too costly, since workers removed 0.065 to 0.085 in. of carbide from the tool surface each time it came back into the rework shop for salvaging.

Controlled carbide removal answered the problem. Rubberized abrasives removed less than 0.003 in. of carbide in eliminating metal buildup. Salvage now takes far less time. Saving of expensive carbide is calculated at more than 3000 pct.

Needle-sharp, fine-grained rubberized abrasive produces a clean and polished surface. It finds use in finishing such metals as chrome-nickel steel, as well as gold and other precious metals.

Sharpening slitter knives on rotary sheet metal cutters proved costly to one fabricating firm. Every time knives required sharpening (a frequent affair), a gang slitting machine sat unproductively while operators removed and ground rotary cutters.

Re-edge without demounting

Dressing, sharpening and polishing now takes place at the slitting equipment, without removal of knives. While knives rotate in place at cutting speed, operator passes a fine grit, rubber-bonded abrasive cone along sides, edges and ground portion. Cone 1 in. long and 15/16 in. diam mounts on a hand grinder turning at 2700 rpm.

The machine shop of an electric motor builder felt it took too long to turn, face, grind and polish generator collector rings. Workers spent 80 minutes attaining the desired mirror finish on 12-in. diam mild steel rings.

Blocks of fine grit rubber-bonded abrasive now do the work. Gang-mounted adjacent to one another, five blocks mirror-finish the 4-in. wide rings in about six minutes. Finish produced is reported smoother than that attained earlier with coated abrasives.

Use of coarse, medium and fine grit wheels and cones cuts approximately 25 pct from time required for maintenance polishing of punch press dies. First step is removal of bad scratches with coarse grit, followed by medium and fine grits for final polishing. Rubberized abrasives reduce and in some cases eliminate use of diamond lapping compounds, formerly needed.

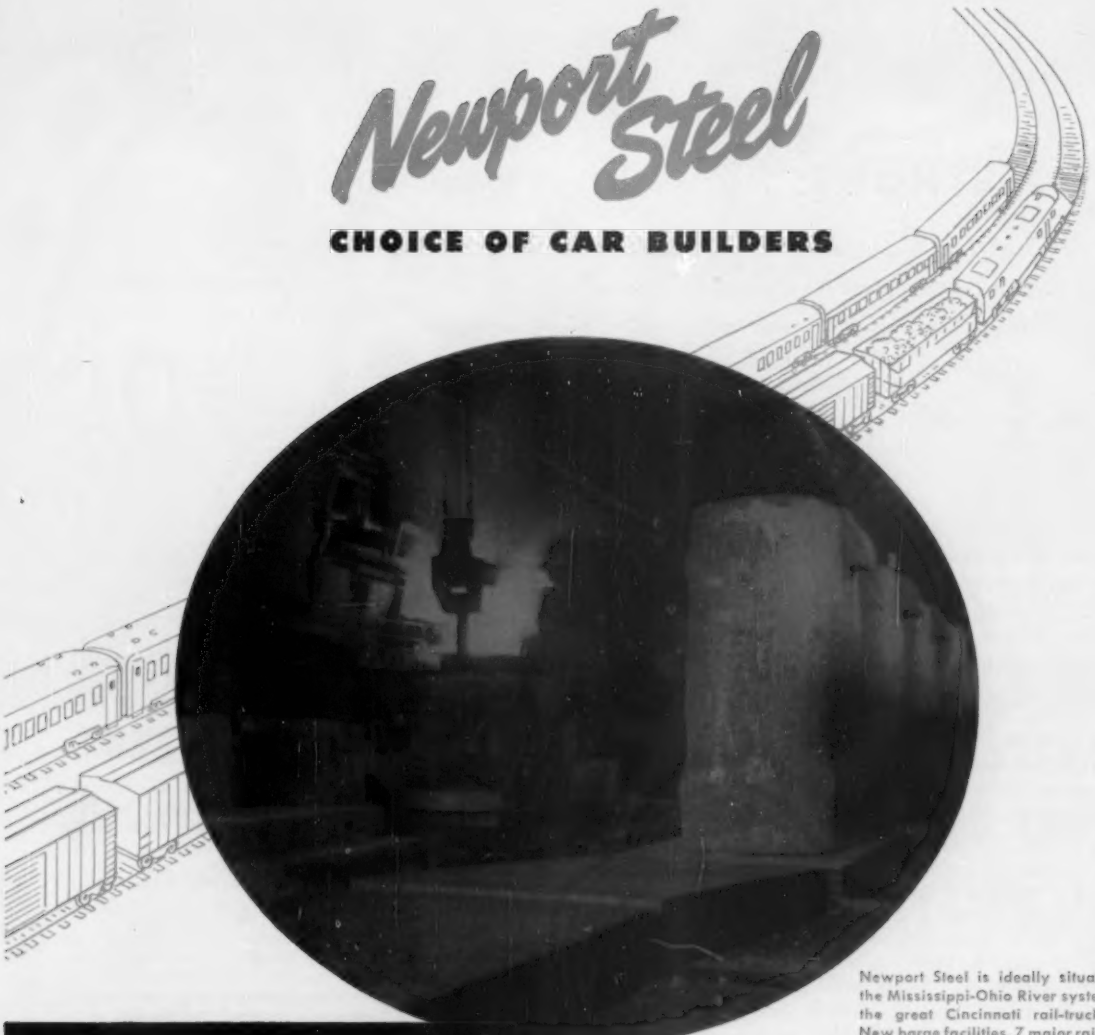
Extra fine abrasive produces a high polish. Normally it's employed immediately before brushing or buffing for a mirror finish.

Dropoff in quality of electric tubes was traced by the maker to foreign matter in the tubes. Emery disks and cloth had been used for deburring and polishing metallic tube components of cold-rolled steel, Kovar, stainless steel, brass and copper. Trouble with foreign matter vanished with introduction of fine grit rubberized abrasive. This and the high polish resulting led the tube maker to specify all tube parts be deburred and polished with rubber-bonded abrasives.

Parts mount in a lathe turning between 900 and 1800 rpm. Wheels ⅞ in. diam and ⅛ in. thick are used, plus 1-in. long points.

Newport Steel

CHOICE OF CAR BUILDERS



Freight and passenger cars now being added to railroad rolling stock include sizable tonnages of Newport steel, for frames, floors, siding, windows and doors. Another example of the versatility of Newport production! Modern equipment and methods combine with 70 years' steelmaking skill to provide the best product and service ever offered by Newport . . . always to the buyer's exact specifications. Location in the heart of America's greatest industrial growth makes Newport an especially attractive source of supply. Discuss with us your need for any of the products listed below.

Newport Steel is ideally situated on the Mississippi-Ohio River system and the great Cincinnati rail-truck hub. New barge facilities, 7 major railroads, 143 motor carriers enable Newport to give economical, dependable delivery to the entire area of the Middle West and South.

ECONOMICAL WATERAIL-TRUCK DELIVERY

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CORPORATION

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PRODUCTS OF NEWPORT STEEL . . . . . **Cold-Rolled Sheets • Hot-Rolled Steel in Coil • Hot-Rolled Pickled Steel in Coil • Hot-Rolled Sheets Hot-Rolled Pickled Sheets • Electrical Sheets • Alloy Sheets and Plates • Electric Weld Line Pipe • Eave Trough and Conductor Pipe • Culverts**

METHODS: Punching Holes

Drilling rails consumes too much time, construction men decide . . . Contractor introduces powder actuated velocity punch that rams piston through rail . . . Cuts clean, no burrs.

Construction men on Philadelphia's new Market street subway tired of the old method of drilling holes prior to rail bonding. The entire job consumed 45 minutes, which the builders thought was too much. The project's electrical contractors then introduced use of a powder actuated velocity power rail punch. This punched the holes and cut job time one-third.

Drilling Is Normal

Rail bonding is the system of connecting various lengths of rail with copper cable to assure electrical contact throughout the rail system. Normally, in the installation of rail bonds a hole is drilled in the rail. Then a bonding plug, holding the cable is driven into this hole.

W. V. Pangborne Co., Inc., the contractor, exclaims, "Now we can do the job in 15 minutes, only one-third of the time it used to take." Time saving is accredited to no drilling, and no reaming.

The rail punch, a product of Velocity Power Tool Co., Pittsburgh, is a self-contained, portable tool. Weighing 61 lb, it can punch holes up to 1¼ in. diam, through 90 to 115 lb rails. The Philadelphia subway rails are 100 lb stock.

Boom, There's The Hole

The tool is actuated by a special blank cartridge of smokeless gun powder, fired behind a punch piston. It is operated by two workmen. One retracts the piston with a tool provided for that purpose. Then he inserts the punch and a cartridge. The other, working on the punch's opposite side, positions it on the rail and clamps it by tightening the receiving die screw.

WANT MORE DATA?

You may secure additional information on any item briefed in this section by usng the reply card on page 109. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

Using a special hammer, the first man then fires the cartridge. The punch goes through the rail and is captured in the receiving die, along with the slug punched from the rail. The punched rail is said to have no burrs or imperfections on either side. Therefore it contains no further working.

The rail punch is also used for punching bolt holes in rail ends.

Machining:

Broach 74 in. long is completed.

One of the largest broaches of its kind ever produced was recently completed for a major manufacturer of heavy earth-moving equipment. It is of the 79-spline

Broach has a diam of 8.040 in. and is 74 in. long overall.

MEEHANITE CASTINGS ARE MADE ONLY BY MEEHANITE FOUNDRIES

The American Laundry Machinery Co., Rochester, N. Y.
Atlas Foundry Co., Detroit, Mich.
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Compton Foundry, Compton, Calif.
Continental Gin Co., Birmingham, Ala.
The Cooper-Bessemer Corp., Mt. Vernon, Ohio and Grove City, Pa.
Crawford & Doherty Foundry Co., Portland, Ore.
DeLaval Steam Turbine Co., Trenton, N. J.
Empire Pattern & Foundry Co., Tulsa, Okla.
Farrel-Birmingham Co., Inc., Ansonia, Conn.
Florence Pipe Foundry & Machine Co., Florence, N. J.
Fulton Foundry & Machine Co., Inc., Cleveland, Ohio
General Foundry & Mfg. Co., Flint, Mich.
Georgia Iron Works, Augusta, Ga.
Greenlee Foundry Co., Chicago, Ill.
The Hamilton Foundry & Machine Co., Hamilton, Ohio
Hardinge Company, Inc., New York, N. Y.
Hardinge Manufacturing Co., York, Pa.
Johnstone Foundries, Inc., Grove City, Pa.
Kanawha Manufacturing Co., Charleston, W. Va.
Kennedy Van Saun Mfg. & Eng. Corp., Danville, Pa.
Koehring Co., Milwaukee, Wis.
Lincoln Foundry Corp., Los Angeles, Calif.
Palmyra Foundry Co., Inc., Palmyra, N. J.
The Henry Perkins Co., Bridgewater, Mass.
Pohlman Foundry Co., Inc., Buffalo, N. Y.
Rosedale Foundry & Machine Co., Pittsburgh, Pa.
Ross-Meehan Foundries, Chattanooga, Tenn.
Shenango-Penn Mold Co., Dover, Ohio
Sonith Industries, Inc., Indianapolis, Ind.
Standard Foundry Co., Worcester, Mass.
The Stearns-Roger Mfg. Co., Denver, Colo.
Valley Iron Works, Inc., St. Paul, Minn.
Vulcan Foundry Co., Oakland, Calif.
Dorr-Oliver-Long, Ltd., Orillia, Ontario
Hartley Foundry Div., London Concrete Machinery Co., Ltd., Brantford, Ontario
Otis Elevator Co., Ltd., Hamilton, Ontario

SEND FOR BULLETIN TODAY

• **"HOW TO MACHINE MEEHANITE CASTINGS" BULLETIN NO. 29**

Write today to Meehanite Metal Corporation, Dept. 1A, 714 North Avenue, New Rochelle, N. Y.

MEEHANITE®

Heavy milling operation on a Meehanite Casting indicates the free machining qualities of Meehanite Metal.

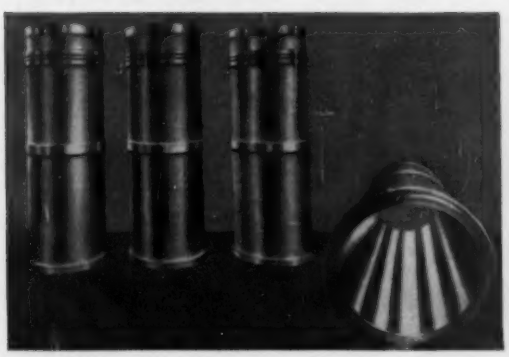
FREE MACHINABILITY OF MEEHANITE CASTINGS INCREASES TOOL LIFE, REDUCES MACHINING COSTS

Machining time to turn, bore, face, key seat, drill, tap and cut on a 3 ft. worm gear. The tabulation below shows savings possible with Meehanite Metal.

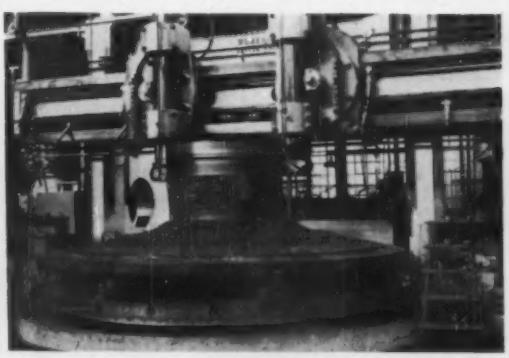
STEEL CASTING 69,000 psi	ALLOY CAST IRON 40,000 psi	MEEHANITE TYPE GB 45,000 psi	MEEHANITE TYPE GB 45,000 psi
183 lbs. metal removed in 20.1 hours.	170 lbs. metal removed in 15.83 hours without coolant.	170 lbs. metal removed in 10.53 hours without coolant.	170 lbs. metal removed in 7 hours with coolant.

The consistent and uniform machining characteristics of the engineering types of Meehanite Metal result from a unique manufacturing process which controls the microstructure of the casting. The homogeneity of structure and uniformity of casting soundness permit higher feeds and faster speeds, thereby reducing to a minimum machining costs as well as casting rejects. Retention of accuracy of casting form and size allows Meehanite castings to be made within definite dimensional limits to further reduce machining costs.

For additional information on the machining advantages of Meehanite, write today for Bulletin No. 29, "How To Machine Meehanite Castings."



Cylinder liner weighing 1100 lbs. were cast in Meehanite type "GB" to give a high machine polish.



Meehanite Ball Mill Head 12 ft. O.D. with 44" diameter trunnion. ¾" deep cut at 140 ft./min. cutting speed removed 37.8 cu. in./minute.

MEEHANITE METAL®

MEEHANITE METAL CORPORATION • NEW ROCHELLE • NEW YORK

involute type. The extremely large broach has a diameter of 8.040 in. and an overall length of 74 in. It will produce splines in a 4.750 in. long steel workpiece in a single pass. The pull end and the follow-rest end are both detachable from the broach shell. The broach was done at the Continental Tool Works Div. of the Ex-Cell-O Corp.

A highlight of the critical manufacturing operations necessary was the hardening process applied to the tool. This was handled and fully controlled within the Continental plant by the division's own heat treat operators.

Boring Assures Uniformity

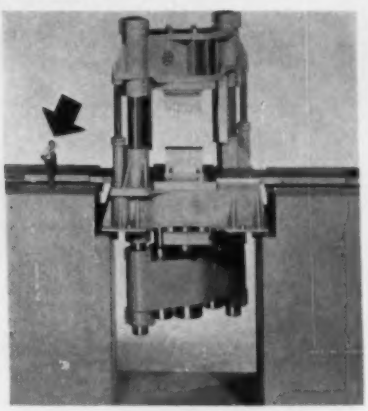
To assure hardness uniformity, a hole 3½ in. in diam was bored lengthwise through the steel prior to heat treat. This boring also helped to lighten the finished weight of the broach to approximately 840 lb. Support of the broach during machining operations, required special steady-rests to maintain the concentricity to produce close tolerances.

The big broach is one of a series being produced for construction equipment builders, in connection with the new national road program.

Forging:

Allegheny Ludlum press weighs 2000 tons

Thirty forging strokes a minute are expected from a 2000 ton self contained hydraulic forging press now under construction for the Allegheny Ludlum Steel Corp., Dunkirk, N. Y.



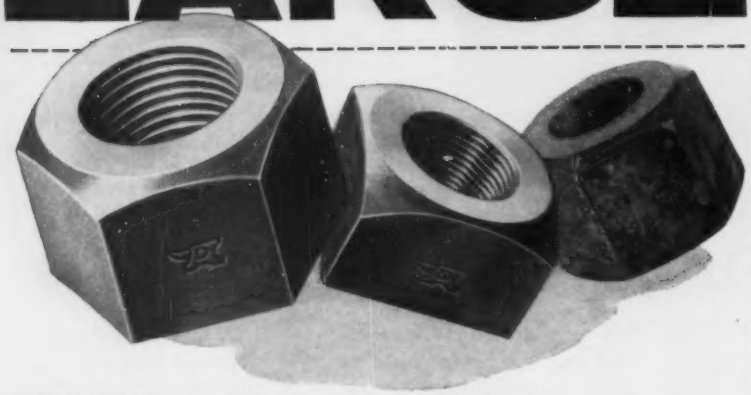
Average size worker (arrow) views 2000 ton forging press.

The single action press is of a pull down, two column design. It is presently being manufactured by the Lake Erie Engineering Corp., Buffalo.

Capable also of 60 planishing strokes per minute, the press stands 19½ ft above the floor, while 15 ft are below. The press' bed is equipped with a movable die slide powered by a hydraulically operated gear and rack arrangement. The slide consists of six 7 ft long coupled units. It travels through 24 ft and constitutes the lower booster.

Clearance between the shields

LARGE



DYSON FORGED NUTS • BOLTS • BLANKS

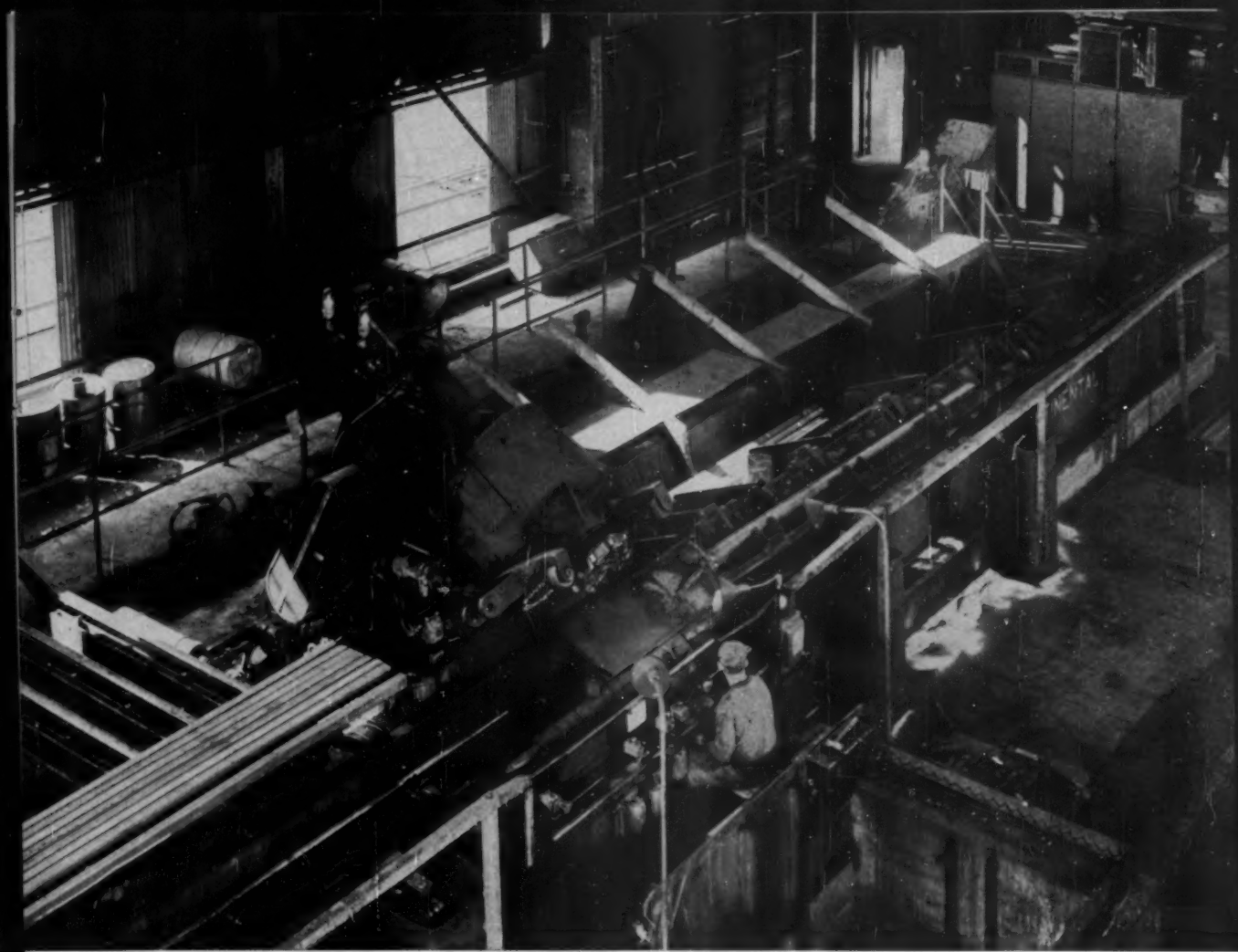
This 36-page large fastener catalog contains complete dimensions, specifications and prices on Dyson large forged nuts. Dyson large nuts, bolts and blanks are forged in a modern plant devoted exclusively to large fasteners. Prompt service on special requirements. Adequate Steel Stocks, machining and heat treating facilities.

JOS. Dyson & SONS Inc.

5125 ST. CLAIR AVE. CLEVELAND 3, OHIO HENDERSON 1-6157

THERE'S NO SUBSTITUTE FOR QUALITY

MECHANITE METAL CORPORATION • NEW ROCHELLE • NEW YORK



BLAW-KNOX makes what it takes

for continuous, mechanical chipping

The Continental Chipper with auxiliary equipment is a complete mechanical system for sorting, handling, inspecting and chipping billets. This integrated system has demonstrated in-service cost savings over manual conditioning. It represents a wise investment in long range modernization programs for conditioning for subsequent rolling in merchant and bar mill operations.

Product quality improvement is immediate, positive. Precise chipping is accomplished by a non-traveling cutter head under which the billet moves in a fashion similar to a milling machine. All chipping is done at close range, immediately in front of the operator. This single operator, located in front of the cutter head controls the entire operation including all material handling.

The chipper is equipped with special interlocking devices which eliminate unsafe operation. Usual chipping bay hazards such as high pressure air lines, improperly handled chisels, and flying chips are removed. The Continental Chipper accommodates billets up to 30 feet in all merchant and bar mill sizes.

For complete details, write for illustrated booklet.

50th Anniversary
BLAW-KNOX
1906-1956

BLAW-KNOX COMPANY
Foundry and Mill Machinery Division
Blaw-Knox Building • 300 Sixth Avenue
Pittsburgh 22, Pennsylvania

which protect the columns is 40 in. (front to back) and 90 in. (left to right). Its maximum working stroke is 72 in. with 120 in. maximum daylight between the top and bottom boosters.

Cylinders In Crosshead

The center cylinder and the two side cylinders governing the pull-down action are inserted in the lower crosshead. Two cylinders inserted in the bed platen interact with the pistons coupled to the upper crosshead for push-back action.

Has 20 Pumps

Twenty pumps, each with a 34.9 gpm capacity of turbine oil at 4420 psi, are driven by ten double-end, 150 hp, 1200 rpm motors. This equipment is located away from the press while a pressurized prefill tank is mounted at the press and is connected directly to the press by a large diam pipe.

from the hand of the specialist . . .

To Your Specifications

ERIE Bolts • Studs • Cap Screws • Nuts

In Alloys • Stainless • Carbon • Bronze

Designers and engineers from every field of industry submit their exacting specifications to us for special fasteners to resist corrosion, extremes of temperature, tensile, fatigue, impact, and shear stresses. For more than 40 years our skilled craftsmen have met the requirements of construction and farm machinery, of transportation, refining and railroad equipment, the heavy machines of industry, pressure vessels, compressors, pumps, in widely diverse applications. We are prepared to serve you well. Send us your fastener specifications for prompt estimate.

A SUBSIDIARY OF BARIUM STEEL CORPORATION

ERIE BOLT & NUT CO.

Erie, Pennsylvania

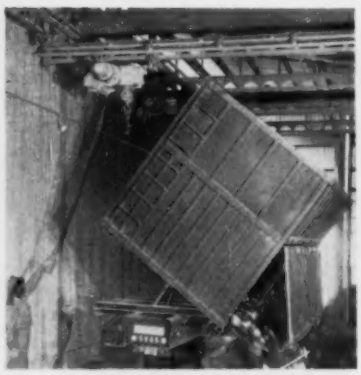
Representatives in Principal Cities

Handling:

Rubbish industry, like others, has handling problems.

Los Angeles By-Products Co. salvages cans delivered to the plant by the City of Los Angeles rubbish trucks. The cans are emptied into any of six very deep hoppers by tipping the truck containers with Cleveland Tramrail cranes.

There are four 6000 lb cranes on the runway. These are divided into two pairs and each pair is tied together to form a unit. One unit is required for emptying a container. Since most of the semi-trailers used for this service have two containers, the crane unit can empty both at the same time.



Two 6000 lb cranes solve this knotty handling problem.

The bridge travel and hoist of all four cranes are motorized and push-button controlled. Carriers are hand-propelled in order that they may move in accordance with the pull of the load. The hoist limit switches are set to stop the hoists when the containers are tipped the maximum allowable.

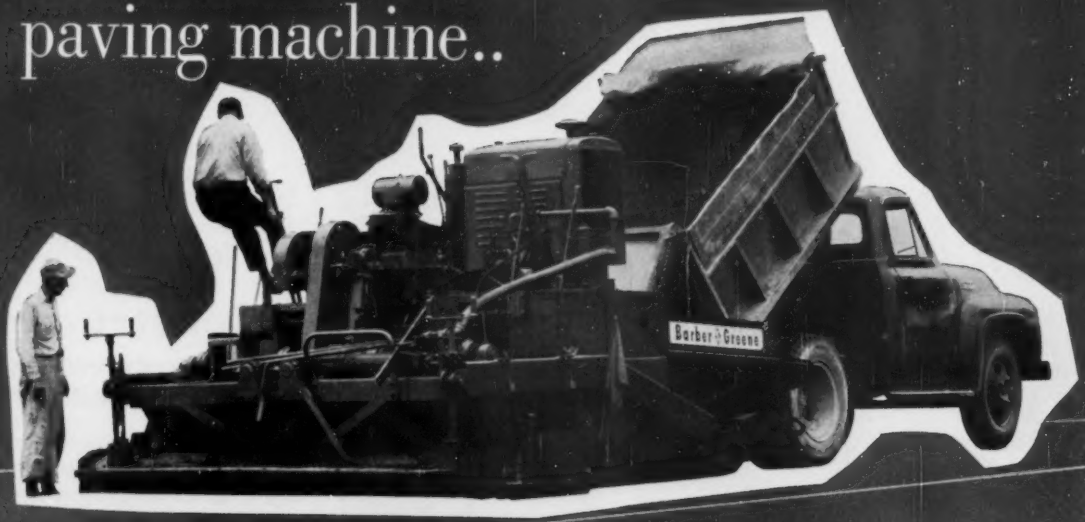
Metals:

New type forum at Metals Show

Announcement has been made by Wm. H. Eisenman, secretary of the American Society for Metals, of addition of a new type technical forum to the program of the

.. for strength
.. for accuracy

16 important operating PARTS of this Barber-Greene paving machine..



..are made of ground and polished

La Salle STRESSPROOF®
SEVERELY COLD-WORKED, FURNACE-TREATED
STEEL BARS

This dependable Barber-Greene paving machine uses 16 separate parts, all made of quality ground and polished STRESSPROOF steel bars.

Why STRESSPROOF? It has the needed strength, without heat treating . . the accuracy of the ground and polished finish . . plus excellent machining.

STRESSPROOF makes a better part at lower cost.

If you make parts requiring ground and polished accuracies or finish, plus these in-the-bar qualities . . (1) High Strength, without heat treating, double that of ordinary cold-finished shafting, (2) Machinability, fully 50% better than heat treated alloys of the same strength, (3) Wearability, without case hardening and (4) Minimum Warpage . . then STRESSPROOF offers you definite advantages. Write or call for further information.

La Salle manufactures America's most complete line of quality cold-finished steel bars.

Ask for your copy of helpful data bulletin No. 15 "Improve Quality . . Cut Costs"

La Salle STEEL CO.
1436 150th Street, Hammond, Indiana

Please send, "Improve Quality . . Cut Costs" booklet.

name_____

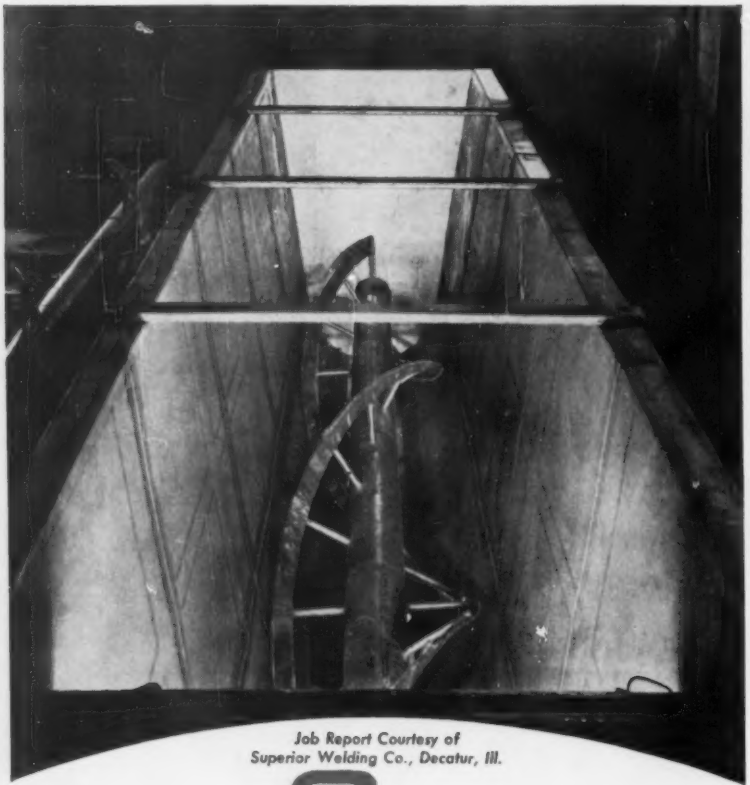
title_____

company_____

address_____

city_____ zone____ state_____

How to get longer service from stainless welded equipment



Job Report Courtesy of Superior Welding Co., Decatur, Ill.

WELD WITH ARCOS

STAINLESS ELECTRODES

Processing certain foods in equipment such as this corn germ separator often releases acid by-products. These by-products, although weak, often corrode the equipment and contaminate the food unless the equipment is made of the "right" stainless. For welding the trough and agitator sections, two types of ARCOS Electrodes were used—Chromend KMo and Chromend 25/20 Mo respectively. These electrodes meet all the essentials: trouble-free welding, unbroken weld performance in service, and freedom from contamination. ARCOS CORPORATION, 1500 South 50th Street, Philadelphia 43, Pa.

upcoming National Metal Show. It will be held in Cleveland in October.

Subject of the session is "Die Wear and Die Life in Stamping Operations." The forum is designed, according to Eisenman, to provide "an exchange of ideas which should help develop uniform methods of recording data on die wear and life."

Paul G. Nelson, of The Budd Co., will be chairman of the meeting, scheduled for Oct. 11, with morning and afternoon sessions.

Three topic groups are planned: (1) Minimizing Die Wear by Die Design; (2) Minimizing Die Wear by Part Design, and (3) Effect of Press Speed on Die Life.

Construction:

Churches using factory-made buildings

Churches have begun to order factory-made buildings, of the standardized steel-framed type widely used in industry, as a way of solving their expansion problem.

This has been reported by E. Gordon Ball Jr., vice president in charge of sales for Luria Engineering Co., a leading producer of standardized buildings for industry.

Typical church interior shows steel frame construction.

He said contracts to produce such "packaged" buildings have been received recently from Ill. and N. J., church organizations. Similar church structures were produced earlier for erection in Ohio and at

Thule Air Base, Greenland.

Among church edifices previously produced by Luria are a 6000 sq ft house of worship for St. Margaret Mary Church in South Euclid, O. and a church of the same size for St. Raphael's Catholic Church, Bay Village (Cleveland).

New Books:

"Management For Tomorrow" is a proceedings report on the 8th Annual conference of the Society for the Advancement of Management. It gives a sleeves rolled up, hair let down review of verbal sharpshooting on business and industry subjects. Observations are given by management leaders, including: H. Thomas Hallowell, Jr., Standard Pressed Steel President; Vernon D. Northrop, Ex. V.P., Phila. Food Distribution Center; G. Raymond Killian, Philco Corp. General Auditor; W. C. Cooling, of International Resistance Co. and Howard MacDonald of Minneapolis-Honeywell. Many subjects pertaining to management are covered. 195 pp. 38 illustrations. Available at bookstores. $6.00 per copy. Chilton Co., Chestnut & 56th Streets, Phila. 39.

"Report On The Helicopter," by Samuel C. Williams, Associate Professor of Industrial Engineering, Stevens Institute of Technology, is an extensive report on evolution of the helicopter. The book attempts to measure objectively, in a qualitative manner, the role of this type aircraft. It traces its modest beginning from Leonardo da Vinci's "air screw" to the present-day helicopters and convertiplanes. Several illustrations and numerous statistical data cover helicopter production, engineering, economics and more. Its history, industrial growth, potential applications, cost, operation, reliability and potential demand are reviewed in text. Several appendices give fresh and interesting facts to bolster author's belief that the helicopter "seems assured of an important niche in the transportation structure along with the ship, railroad, motor vehicle and fixed-wing aircraft." 220 pp. Price: $2.50. Stevens Book Store, Stevens Institute of Technology, Hoboken, N. J.

More proof . . . how to get *consistent* results from submerged arc welding

Courtesy of CF Braun & Co
Engineers and Constructors, Alhambra, California

WELD WITH ARCOS

STAINLESS COILED WIRE

Unfailing strength and resistance to corrosion at elevated temperatures are vital in the welds of this massive 14 ft. diameter, 30 ft. long catalyst pressure vessel. All seam welding of the 1¼% Chrome ½% Moly plate was submerged arc welded with Arcos Chromar *welding quality* wire. Arcos Chromar wire—like every Arcos filler metal product—can be used with confidence on the most critical jobs. Start with Arcos and be sure of uniform dependable weld metal—from start to finish. ARCOS CORPORATION, 1500 South 50th Street, Philadelphia 43, Pa.

"That Personal Touch . . .

Makes it a PLEASURE to Order from Lamson & Sessions"

"We're just like everyone else . . . production costs keep going up yet we're forced to meet competition by turning out more and better products at a lower cost."

"How to do this, of course, is the big problem. Our engineers say, "Cut this, cheapen that, etc."

"But it took the Lamson man to take our problem personally. Why he acted as if it *were* his problem. In fact, he showed us how a 'standard' Lamson fastener could replace a 'special' at lower cost and still cut assembly time."

Sounds trite? Not at all. Qualified Lamson men solve problems like this every day because they take them to heart, study them and recommend improvements . . . personally, yet backed by the world's leading manufacturer of fasteners.

YOU GET MORE WHEN YOU BUY FROM . . .

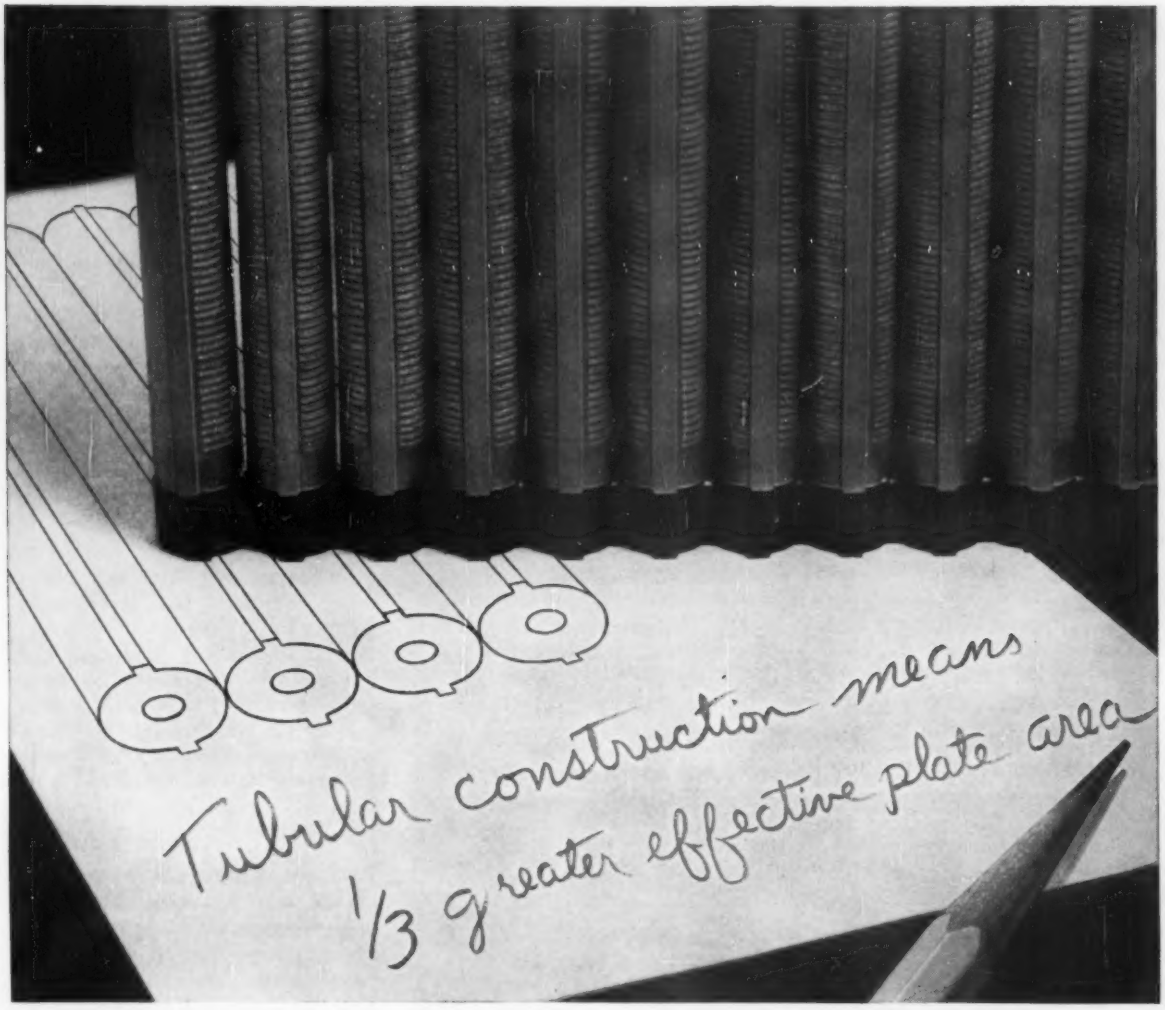
Lamson & Sessions

The LAMSON & SESSIONS Co.

1971 West 85TH St. • Cleveland 2, Ohio

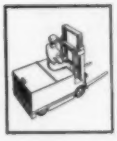
CLEVELAND AND KENT, OHIO • BIRMINGHAM • CHICAGO

EXIDE-IRONCLAD BATTERIES



Greater effective plate area boosts power for peak loads

BATTERY FOR POWERED HAND TRUCK, Model TH. Fits snugly into space provided on truck. Has tubular construction of positive plates, Silvium grids, "Permanized" negative plates, extra heavy connectors and all other Exide-Ironclad advantages that mean power to spare in heavy duty applications. Write for Bulletin 5161.



According to general principles of storage battery engineering, power reserve is governed by positive plate area. In the Exide-Ironclad greater effective plate area is achieved without increasing plate size. Here's how:

In the Exide-Ironclad positive plate, active material is held captive in tubes of slotted polyethylene. These tubes are arranged in a tight row with electrical connections only at the top. The actual surface of the plate is the combined semicircular sides of these tubes—the total surface area being roughly one-third more than the projected dimensions of the plate.

In use, this unique design feature means that more active material is exposed to electrolyte for a given size battery. It means the battery can provide power to spare for peak loads as well as a dependable source of continuous power.

Only Exide-Ironclad Batteries have this advantage. Be sure to specify them when you order—for either new equipment or for replacement. Exide Industrial Division, The Electric Storage Battery Company, Phila. 2, Pa.

Exide®

FREE AIDS

New Technical Literature:

Catalogs and Bulletins

Airblast cleaning

Bulletin describes blast cleaning cabinet for small or intermittent work. New eight page brochure contains 15 photographs and drawings illustrating the airblast cabinet. Two tables present dimensions and specifications. *Pangborn Corp.*

For free copy circle No. 1 on postcard, p. 109

Self-clinching fasteners

Load carrying threads can be obtained in thin steel, brass, copper or aluminum sheets with one firm's self-clinching nuts. Installed in drilled or punched holes with standard tools, nuts are available in wide range of thread sizes and types. *Penn Engineering & Mfg. Co.*

For free copy circle No. 2 on postcard, p. 109

FOR YOUR COPY

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, page 109.

Oscillograph

Dozen page booklet, plus engineering data slipsheets, gives rundown on a recording oscillograph. This is described as the "ultimate in dependability, accuracy, speed." It is said to have unlimited applications. Also reviewed are galvanometers. *Consolidated Electrodynamics.*

For free copy circle No. 3 on postcard, p. 109

Another of the Reasons Behind Brad Foote Quality—

METALLOGRAPHY

• The heat treatment a gear receives is probably the most important single factor in determining its long range wear characteristics. Here at BRAD FOOTE we pride ourselves on having equipment designed to provide the widest possible variety of heat treatments.

• But in addition to standard heat treating and testing equipment we have a few extra safeguards. One of these, rather unusual in our business, is a complete Metallographic laboratory. Specialized equipment allows us to examine or photograph the grain structure of all of our metals, in order to determine the most effective methods of heat treatment and to serve as a check on the quality of finished work.

• Metallographic examination is just one of the many reasons behind BRAD FOOTE quality. Prove to yourself the savings this extra quality can mean. Let us quote on the gear requirements for your next program, without obligation.

BRAD FOOTE MAKES ALL TYPES OF GEARS— IN A COMPLETE RANGE OF STYLES AND SIZES

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subsidiaries: AMERICAN GEAR & MFG. CO. Lemont, Illinois • Phone Lemont 920 | PITTSBURGH GEAR COMPANY Pittsburgh 25, Penn. • Phone SPalding 1-4600

Aluminum handbook

Comprehensive reference handbook on aluminum provides up-to-date data on aluminum alloys and mill products in an easy-to-read tabular form. There is little text. Book contains information on alloy standards as well as the properties, sizes, and tolerances of mill products usually produced from them. Introductory section explains the code numbering system employed to designate alloys and their modifications. Subsequent sections in the 176-page book deal with wrought alloys; sheet and plate; wire, rod, and bar; extrusions: tube and pipe; electrical conductor; structural shapes; forgings, and casting alloys. *Available by writing on company letterhead to Aluminum Co. of America, 781 Alcoa Bldg, Pittsburgh 19.*

For free copy circle No. 4 on postcard, p. 109

Gear booklet

All types of gears are covered in a catalog now available. Especially well presented and illustrated are the company's line of spur gears, helical gears, bevel and miter gears, and worm and worm gears. Also covered are lead and feed screws, shafts, segment gears, racks, sprocket wheels, ratchet wheels, internal gears and transmissions. *The Adams Co.*

For free copy circle No. 5 on postcard, p. 109

Acid resistant brick

New series of engineering drawings incorporates latest technology in construction methods for acid resistant brick installations. Graphically diagrammed are details of acid proof masonry construction for six typical installations: a bump base, column pad, tank outlets, bell and spigot joints, floors and trenches. *Pennsylvania Salt Mfg. Co.*

For free copy circle No. 6 on postcard, p. 109

Carbide blanks

Wide range of carbide blanks are listed in a new 12 page catalog. Prices, sizes, styles and shapes appear. *Besly-Welles Corp.*

For free copy circle No. 7 on postcard, p. 109

Torque converter

Single-stage torque converter, is covered in a new bulletin. Illustrations and tables on the single-stage converter fluid circuit, hp and rpm capacity, and specifications are included. *Twin Disc Clutch Co.*

For free copy circle No. 8 on postcard, p. 109

Set screws

Twenty-eight page specialized catalog lists set screws. Described are every type of standard set screw and many special types designed to meet special conditions of vibration, close precision setting, resistance to tampering, chemicals or heat, need for increased holding power, etc. *Set Screw & Mfg. Co.*

For free copy circle No. 9 on postcard, p. 109

Motor pulleys

Improved design features of motor pulleys are presented in a new catalog. This series is available in capacities from ¼ hp to 1½ hp and in speed ratios up to 2.75: 1. *Reeves Pulley Co.*

For free copy circle No. 10 on postcard, p. 109

Coupling selection

Coupling selection chart reduces time necessary to select a flexible coupling. The chart, 22 x 17 in., may be hung on the wall, inserted under a glass desk top or folded for easy filing. *Morse Chain Co.*

For free copy circle No. 11 on postcard, p. 109

Control system

Eight-page folder illustrates and describes new signal generator and control system. A page and a half is devoted to a detailed description of the instrument; more than three pages cover product applications with typical problems posed with solutions offered through tested examples. Another section gives information on the selection of cabinets, while still another page is devoted to detailed specifications. *Brush Electronics Co.*

For free copy circle No. 12 on postcard, p. 109

No. 18 in a Series

in Lansing, Michigan

4 out of 5 use

WHEELABRATOR®

STEEL SHOT

American businessmen know a good thing when they see it. The overwhelming preference for Wheelabrator Steel Shot is a good example. Take Michigan's capital city. Wheelabrator Steel Shot is used in 80% of all airless blast cleaning equipment. It is used in 4 out of 5 machines in Lansing because it gives lowest COST cleaning . . . lowest shot consumption, lowest maintenance and highest production. For instance, Lindell Drop Forge Company reports shot consumption decreased 50%, cleaning time shortened 25% and equipment maintenance sharply reduced. Whatever your cleaning problem, wherever you're located, you can save with Wheelabrator Steel Shot. Write now for Bulletin 89-B.

WHEELABRATOR CORPORATION

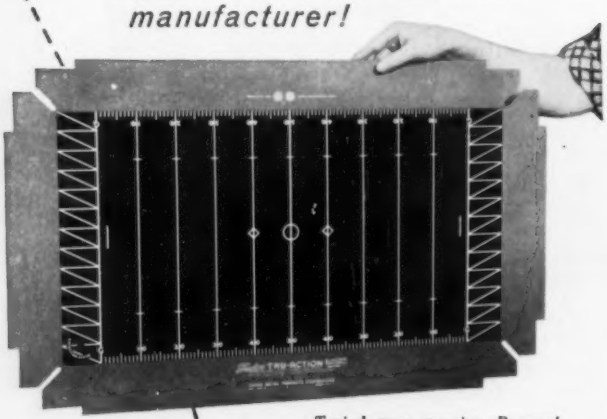
World's Largest Manufacturer of Steel Abrasives

510 South Byrkit St., Mishawaka, Indiana

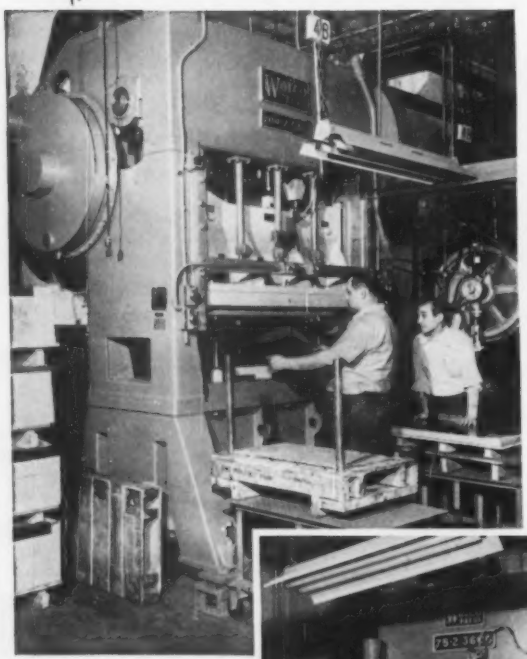
The highly popular Tudor Tru-Action Electric Football Game. Tudor also makes electric baseball and horse racing games.

"Warco's a winner!"

says leading metal game manufacturer!

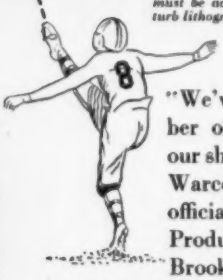


Typical game stamping. Presswork must be accurate, clean and not disturb lithography.



Press Foreman Andrew Harris watches as press operator Andrew Amodeo operates 100-ton Warco Crank Press.

Salvatore Cordero puts flanges on stamping with Warco 75-ton Crank Gap Press.



"We've tried quite a number of different presses in our shop—and in our books, Warco is a winner," say officials of the Tudor Metals Products Corporation of Brooklyn, N. Y., one of the nation's leading manufacturers of metal games.

"Clean and neat of design, they perform with businesslike efficiency, with a minimum of maintenance. We like what we have seen, and certainly must give them an inside track when considering new press equipment."

If you haven't as yet talked with a Warco user, why not let us put you in touch with one in your area. We know he'll convince you that Warco will win for you, too.

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FREE TECHNICAL LITERATURE

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

This section starts on p. 106.

Variable speed drives

Variable speed drives with touch control is subject of new bulletin. It contains information about features, operating principle, design, component parts, definition of engineering terms and formulas and includes selection tables and graphic illustrations of drive dimensions. Also contained in the bulletin is complete information about allspeed modifications and accessories as well as pictorial illustrations of allspeed drive applications. *Worthington Corp.*

For free copy circle No. 13 on postcard

Packaging guide

The 17th edition of Packaging and Carloading Guide has just been published. Handy, 48 page booklet tells how to package and carload. Company's complete line of packaging and carloading materials, strapping, seals, strapping tools, grain doors, retaining strips, etc., are shown and described, and instructions are given in their application. *Signode Steel Strapping Co.*

For free copy circle No. 14 on postcard

Chuck catalog

New catalog lists firm's complete line of manually operated chucks. Aside from being a complete engineering manual with detailed dimensional drawings and dimensions for all chucks, it features a simplified method of chuck listing. This enables quick selection of the type chuck desired. In addition to a new series of airtight chucks, an entire section has been devoted to descriptions of many special-purpose chucks. *Cushman Chuck Co.*

For free copy circle No. 15 on postcard

Power presses

Company's line of standard, high production and patented power percussion presses is described in a new color catalog. Many models for various industrial requirements are illustrated with detailed specifications, capabilities and capacities included. *Zeh and Hahnemann Co.*

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Leaded steel

Illustrated booklet points up advantages of using firm's leaded steel. It contains test data and microstructures showing product's even lead distribution and machining characteristics. Included in the test data is a chart of the physical properties of Hi-Qua-Led in 11 grades and section sizes. *ALCO Products, Inc.*

For free copy circle No. 17 on postcard

Installation problems

Eighteen case histories of typical installation problems preventing full machine tool utilization are described in a new folder. Cases are taken from experiences of 42 machine tool builders. Cases range from speeded up installation of a 400 ton punch press to vibration isolation for a sensitive optical system built into a new visual grinder. The press was put into operation in 30 minutes from time of delivery. Other case histories reported include mounting of several types of milling machines, a turret punch press, a precision gear grinder, a power shear, several types of surface grinders and diverse punch presses. *Barry Controls, Inc.*

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Easy to clean

Literature describes new air line filter - regulator - lubricator which drains from the bottom without removing the bowl. "Simply open the ¼ in. bottom bowl fittings for fast cleaning of the filter and lubricator," it states. Pressure regulator operates in an inverted position to permit a more compact, space-saving installation that can be designed into any air-powered equipment. The regulator gauge has an unbreakable face. *Keller Tool Div., Gardner-Denver Co.*

For free copy circle No. 19 on postcard

Cold-headed parts

Included in the second issue of a new four-page two-color company publication, are seven case-histories covering examples of how cold heading cuts costs in manufacturing small parts. Illustrating each case history is a photograph and line drawing of the part under discussion. *John Hassall, Inc.*

For free copy circle No. 20 on postcard

Tractor shovels

Informative bulletin illustrates a wide variety of industrial materials-handling applications for tractor-shovels, including case histories of their operation in a number of plants. Reports on bulk-material handling methods include use of units in foundaries. Specifications on the complete line is provided, as well as a map showing locations of more than 200 distributors. *Frank G. Hough Co.*

For free copy circle No. 21 on postcard

Humidity instruments

Bulletin describes company's line of humidity recording and controlling instruments. Two - color 22-page bulletin contains information on indicating, recording, and automatically controlling wet and dry bulb instruments, and psychrometers (direct reading type). Models for permanent mounting in various types of installations, as well as portable models are offered. A full line of accessories, including wet bulb fixtures, valves, and motor operators for louvers, ducts, etc. are included. *The Bristol Co.*

For free copy circle No. 22 on postcard

Atmosphere furnaces

Improved controlled atmosphere reciprocating hearth furnaces are fully reviewed in a new booklet. Numerous illustrations and interesting text cover construction, applications, etc. Operational advantages are listed. *American Gas Furnace Co.*

For free copy circle No. 23 on postcard

Turbine pumps

Water and oil lubricated Layne vertical turbine pumps, their application, and pump drive heads designed for water wells serving industry, municipality and agriculture are described in a new four-color bulletin. Pumps are also practical for pumping from lakes, reservoirs and streams. *Layne & Bowler, Inc.*

For free copy circle No. 24 on postcard

Industrial trucks

Industrial truck line is reviewed in brief in a new brochure. Included are: a line of pneumatic-tired lift trucks in capacities from 1000 through 20,000 lb; modern 3000, 4000 and 5000 lb capacity cushion - tired lift trucks; larger models (6000, 7000, 8000) being readied for mid-1957 release, and others. *Hyster Co.*

For free copy circle No. 25 on postcard

Dual ram broaching

Operating characteristics and capacities of dual ram bloaching machines are described in a bulletin. Also included is a brief description of a drive design that permits these machines to operate with smoothness and gives improved surface finishes at up to 200% faster cutting stroke. *Colonial Broach & Machine Co.*

For free copy circle No. 26 on postcard

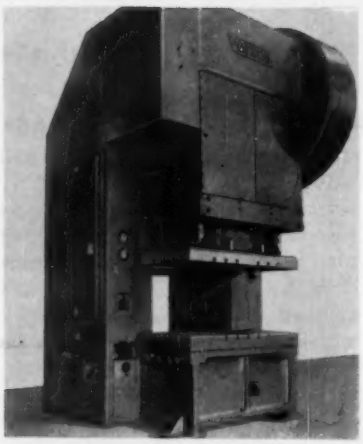
Flangeway guard

Recently printed descriptive folder covers advantages of the company's flangeway guard for the railroad, the industrial plant and for all railroad crossing installations. It shows construction and application. Included is information showing how it is installed. *Kasle Steel Corp.*

For free copy circle No. 27 on postcard

NEW EQUIPMENT

New and improved production ideas, equipment, services and methods described here offer production economies... for more data use the free postcard on page 109 or 110.



Gap press offers safety and convenience features

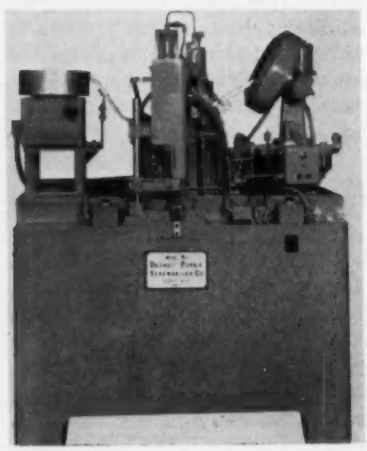
Totally enclosed piping and wiring of all air, lubrication and electrical components are contained in a "streamlined" gap press. In addition, gears, flywheel, clutch and all other moving parts are fully enclosed, incorporating safety and convenience features to protect both operator and press. Die space area is well lighted and there are receptacles and pockets for safety blocks to prevent press from operating while men are working in danger areas. Service outlets of 440 and 110v provide power for portable electric service tools. A self contained air supply system provides air-powered service outlets. Exact position of the ram at any point in the stroke is shown by an electric indicator. It contains a completely automatic lubrication system with all gears totally enclosed and running in oil. A central lifting hook simplifies setting and moving the press. It is even possible to move the press from position to position. *Verson Allsteel Press Co.*

For more data circle No. 28 on postcard, p. 109

Salt bath furnace boasts up to ten years pot life

Design of this new salt bath furnace is said to permit replacement of submerged type electrodes without costly furnace shutdowns. The new removable type submerged electrodes can be changed in an hour even before the molten salt has solidified. The sturdy electrodes are fabricated on non-critical alloys and enter the pot from over the top instead of through the back wall of the casting. Hence, there are no openings below the surface of the salt. An easily removable tile over each pair of electrodes seals off all air. This prevents the oxidation attack on the electrodes that would normally take place at the air-salt interface and assures much longer electrode life. It is said to have a pot life of up to ten years. No lost production time during replacement of new electrodes is an important feature. *Ajax Electric Co.*

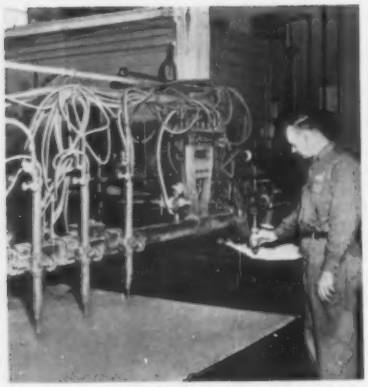
For more data circle No. 29 on postcard, p. 109



Unit semi-automatically assembles rolling hangers

Rolling hangers for sliding doors, etc. are assembled semi-automatically with a special machine. Three feeding devices feed the three components; a shoulder rivet, bronze bushing and a nylon roller. The three components are pre-assembled as follows: the nylon roller is fed from a vibratory feeder into an indexing dial. The bronze bushing or bearing is fed from another vibratory feeder and pressed into the nylon roller. At the next index the shoulder rivet is fed by means of a barrel or rotary feeder and inserted into the pre-assembled roller and bushing. The completed assembly is then ejected into a track twisted 180°, which feeds the completed three-part sub-assembly into a locating fixture. The operator then simply places the steel bracket over the locating pins in the fixture and touches two palm switches. This, in turn, cycles the pneumatic-operated impact hammer. Complete mechanism is mounted on its own base for stability. *Detroit Power Screwdriver Co.*

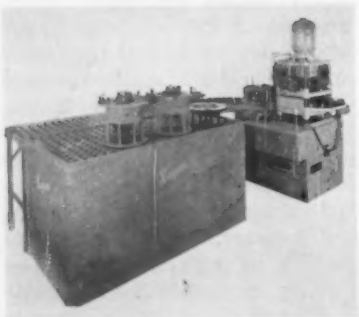
For more data circle No. 30 on postcard, p. 109



Automation in cutting operations is reported

Automation is reported as being applied to cutting operations with this new setup. It utilizes a machine torch in combination with the manufacturer's oxygen saver. Cutting speeds are said to increase up to 30 to 50 pct. Oxygen consumed in preheat flames are reported as reduced up to 80 pct and over-all oxygen consumption is described by as lowered by as much as 20 pct. Even slag removal is reduced. Several cutting torches are lined up in tandem formation and operated from a single station. Preheat oxygen pressures are controlled to as many as eight machine cutting torches simultaneously, with a mere flick of the wrist. By use of the oxygen saver a full, vigorous preheat flame is reportedly established. This permits edge starting or piercing to be accomplished faster than ever before. *Harris Calorific Co.*

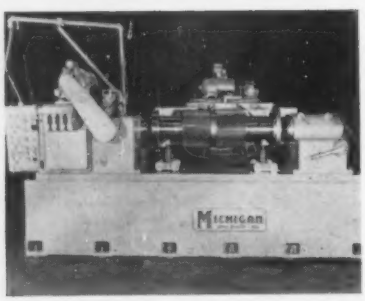
For more data circle No. 31 on postcard, p. 109



Multiple spindle drilling unit allows quick tool change

Changing, limited, intermittent production can be done on this multiple hole drilling machine. The small four-post unit houses 24 in. hydraulic drill heads. Unit is designed to allow easy changing of heads and tooling. Head is changed by dropping the drill head on a loading basket. Each head is carried on its own loading basket, which is rolled on a conveyor and onto the roller table. The only other act required to change the head is to remove and replace the bushing plates and locators. Drill heads drill holes simultaneously, and varying diameters can be handled with a single head, according to the company. *Zagar Inc.*

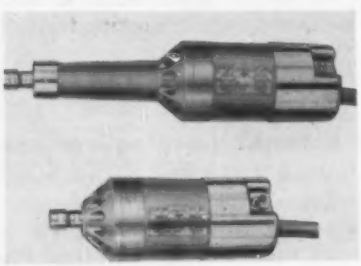
For more data circle No. 32 on postcard, p. 109



Push-button shaver developed for large turbine pinions

Development of a special shaving machine for finishing large turbine pinions has been announced. Finishing rate of this large shaver is placed at 10 to 15 times as fast as former methods. Moreover, the machine is designed for extreme precision. It can shave a gear anywhere on a 100 in. shaft. Dual shaving cutters can reduce machining time when pair of gears are close together. Pendant control box has 32 push buttons. Hydraulic lift jacks raise the heavy workpiece into position for mounting between centers and support when unloading. Ten motors (from ⅓ to 5 hp) provide drive, feed, lubrication and chip separation. *Michigan Tool Co.*

For more data circle No. 33 on postcard, p. 109



Hand grinders have speeds to 30,000 rpm

To enable toolrooms and die-shops to capitalize on developments in high-speed burrs and mounted points, one company is introducing four new models of their high speed hand die grinder. Grinders are in two styles, long nose with overall length 11¼ in. and nubby nose with overall length 7¼ in. Each is available in two speeds, 20,000 rpm or 30,000 rpm. Chucking capacity on all four grinder models is ⅛ to ¼ in. Collect chucks allow burrs and mounted points to be held close to bearing. *Millers Falls Co.*

For more data circle No. 34 on postcard, p. 109

New tool introduced; not a file or rasp

It's not a gadget; not a gimmick, says the maker of this unique metalworking instrument for finishing materials to the hardness of mild steel. Proudly boasts the manufacturer, "Since its cut is not comparable to files and rasps, and because it does jobs planes cannot, it falls into the category of a new tool that does many jobs." It can also be used on copper, aluminum, lead and other metals. Two models are available, one shaped like a plane, the other like a rasp. *Tools. Div. of The Stanley Works.*

For more data circle No. 35 on postcard, p. 109

Hi-Qua-Led...A NEW STEEL MATERIAL

Addition of Lead to Steel for Circular Forgings Lends Cost-Reducing Machinability Without Changing Basic Steel Properties

Since the late 1930's steel manufacturers have searched for a satisfactory method of adding lead to steel for use in circular forgings. Large segregates of lead have been the most important problems to be solved. Now, however, ALCO Products, Inc. has developed a new process which overcomes this obstacle by distributing the lead evenly throughout the steel in a finely disseminated state. It is being marketed under the trade name, "Hi-Qua-Led Steel," in ALCO's rolled forgings, rings and gear blanks.

Development of Hi-Qua-Led

ALCO, in 1954, began a search for a lead-addition method that would cover the entire size range of the company's forged rings and gear blanks — up to 145-inch OD. After initial trials, ingots were produced from 12-in. to 36-in. diameter with lead recoveries as high as 85 per cent. When the ingot sections were forged and rolled into rings, the rings were sectioned and studied for segregation, impact, bend, tensile and other properties. They were uniformly good and lead was distributed as submicroscopic particles. Both ingot and forging sections were completely free of lead segregates. On the basis of these tests, ALCO applied for patents on its lead-addition method.

Advantages in Machinability

Hi-Qua-Led is designed to lower costs in the expensive machining of circular forgings. The lead additive in Hi-Qua-Led Steel acts as a lubricant for the cutting action of the tool, and provides faster removal of metal through heavier cuts and faster speeds. The lead reduces friction to a point where heat is minimized in the section being machined. Tools last longer before redressing or replacement. Some machines, too, can be upgraded through the use of Hi-Qua-Led because their present horsepower will perform cuts that were impossible before. On all machines, Hi-Qua-Led can reduce necessary power output and lower machine wear and tear. In cases where labor and machine time is expensive, machines operating at the same power output cut Hi-Qua-Led faster and deeper.

Hi-Qua-Led STEEL

Trade-mark Reg. applied for

Patent applied for on lead-addition method

Steel Properties Unchanged

ALCO has studied ingots in grades 1015, 1029, 1040, 1050, 1070, 4140, 4150 and 4340 steel, with lead added, and the lead distribution pattern has been unchanged. Customer tests for standard physical-property data and response to carburizing, induction-hardening and flame-hardening have shown that Hi-Qua-Led responds to heat treatment in the same manner as non-leaded steels. Fatigue tests of the reverse-bending type show no difference between Hi-Qua-Led and regular steel heat-treated to 145,000 lb per sq in. tensile.

Use of Hi-Qua-Led Forgings

Hi-Qua-Led circular forgings have a wide application in machining operations where a great deal of metal must be removed, where a very smooth surface finish is desired at low cost, in gear-cutting operations, or almost any milling, drilling or boring application. Threading, planing, shaping and hobbing are also more easily accomplished with Hi-Qua-Led steel forgings.

Hi-Qua-Led may be obtained in any size ALCO forged ring. An extensive inventory of Hi-Qua-Led ingots in many grades is already maintained at the Latrobe, Pa. forging plant. ALCO offices in Atlanta, Beaumont, Chicago, Cleveland, Houston, Kansas City, Los Angeles, New York, Pittsburgh, St. Louis, St. Paul, San Francisco, Schenectady, Tulsa and Washington have complete information. Or, if you wish, send the coupon for a brochure that gives Hi-Qua-Led details.

ALCO

ALCO PRODUCTS, INC.
NEW YORK
Sales Offices in Principal Cities

ALCO Products, Inc., PO Box 1065, Schenectady 1, N. Y.

☐ Please send your brochure, "Facts on Leaded Steel for Seamless Forged and Rolled Rings."

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(Advertisement)

What has the strike done to Ryerson steel stocks?

In general, we are happy to report, our steel stocks are holding up very well—with the inevitable exception of structural and carbon steel plate inventories.

Because we entered the strike period with the largest stocks in the nation, we are still able to give quick shipment of almost every type of steel in normal warehouse quantities—even though we have not been able to replenish most stocks since before the strike began. And in some cases we can supply larger quantities to help you keep production going until your delayed mill shipments arrive. Here's a quick summary of the present status of Ryerson stocks for your guidance.

Sheet and strip—Cold rolled pattern-size sheets and coils stocks are excellent and galvanized stocks are good at most Ryerson plants. Some shortages have developed in our inventories of hot rolled sheets and coils, but when we cannot furnish exactly what you need, we may be able to supply a practical alternate from our inventories of special gauges and sizes. For example, we can sometimes furnish 13 gauge material when 12 or 14 gauge is not available.

Hot rolled carbon bars—Large overall tonnages on hand. Shortages are developing in a few sizes, but we can still take care of practically any hot rolled bar requirement.

Cold finished bars—Stocks more than adequate to meet current demand, both as to tonnage and range of sizes and types. Call us for any quantity of Ledloy, machinery steel, shafting, accuracy stock or other cold finished bar steel.

Tubing—In excellent supply. Seamless and welded mechanical and fluid power tubing, structural tubing and boiler tubes—all available in a full range of sizes, and in almost any quantity.

Alloy bars—Most all types in plentiful supply. Hot rolled alloys are not quite as plentiful as cold drawn—heat treated types not quite as plentiful as as-rolled—but we can almost always furnish your exact requirements or a practical alternate.

Stainless steels—Both straight chrome and nickel-bearing types are in good supply at Ryerson and can be furnished in almost any quantity. However, when your order for nickel-bearing stainless is covered by a rating, please be sure to extend it. You will be helping yourself by helping to assure future availability of these types from stock.

Structurals and plates—In tight supply for many months, these products continue to present the most difficult supply problem. However, check with us on your urgent requirements and we will help you if we possibly can.

Reinforcing steels—Most Ryerson plants are in a very good position to take on new reinforcing business—both re-bar and wire mesh.

Whatever your steel requirements, it will pay you to check with us. The nation's largest steel service organization is still your best source for steel of dependable quality, accurately cut and delivered to meet your schedule. As always, your inquiries and orders are sincerely appreciated.

JOSEPH T. RYERSON & SON, INC.

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The Iron Age SUMMARY . . .

Steel market building up to fourth quarter climax . . . Intensity of automotive demand will determine how serious . . . Steelmakers face raw materials crisis.

Climax Coming . . . The steel market is building up to a fourth quarter climax. How serious it will be depends on requirements of major industries, particularly automotive. But many consumers already are jittery over the outlook due to delivery uncertainties.

For the mills, the outlook is just as shaky. The list of tight products now includes hot-rolled bars as well as plate, structurals, and pipe. Hot-rolled sheet already is booked well into first quarter of next year. For some mills, cold-rolled sheet is filled through December, for all practical purposes.

A critical shortage of aluminum-killed sheet is fast developing. This premium material is in strong demand. But most mills are limited on the amount they can make and the post-strike quality of iron and steel hampered production further.

Mills Face Crisis . . . Oil country goods is another critical product. Some producers were overbooked going into the strike, so that carryovers will be that much heavier unless orders are arbitrarily cancelled to bring books up to date. Mills are filled through fourth quarter, and consumers are clamoring to get onto first quarter '57 books.

Meanwhile, the mills are confronted with a crisis on the raw materials front. Scrap prices have shot through the ceiling and appear to be reaching for the stratosphere. The iron ore outlook has mills worried—although not seriously. Of more immediate concern is pig iron, which accounts for the current run on scrap. Some blast furnaces never got back into production after the strike. Others are on the verge of being taken out of production for relining and repairs.

The tight situation in hot-rolled bars, used extensively in many industries, has developed from growing requirements for merchants bars plus competition for mill space from concrete bars. The latter are important to the booming construction industry.

Auto Requirements . . . Automotive demand could throw the steel market into complete turmoil. It all depends on how the public takes to the 1957 models. But regardless of auto sales, fourth quarter demand from automotive will be heavy to handle initial production schedules of the new cars. And some consumers who now feel they are sitting pretty with good inventories may find themselves scratching for tonnages in a few months.

Steel Output, Operating Rates

Production	This Week	Last Week	Month Ago	Year Ago
(Net tons, 000 omitted)	2,400	2,351	406	2,269
Ingot Index				
(1947-1949=100)	149.4	146.4	25.2	141.0
Operating Rates				
Chicago	96.0	97.5*	6.0	95.5
Pittsburgh	98.0	95.0*	8.0	95.0
Philadelphia	106.0	97.0*	0.0	81.0
Valley	95.0	90.0*	13.0	93.0
West	95.0	96.0*	24.0	97.0
Detroit	97.0	95.0	51.0	57.0
Buffalo	107.0	107.0	0.0	100.0
Cleveland	102.0	99.0*	0.0	98.0
Birmingham	94.0	87.0	3.5	94.0
S. Ohio River	69.0	76.0*	73.0	91.5
Upper Ohio R.	100.0	99.0*	55.0	96.0
St. Louis	89.0	92.0	103.0	105.0
Northeast	95.0	100.0	48.0	74.0
Aggregate	97.5	95.5	16.5	94.0

*Revised

Prices At A Glance

(cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	5.622	5.622	5.179	5.174
Pig Iron (Gross Ton)	$63.04*	$63.15	$61.36	$59.09
Scrap, No. 1 hvy (gross ton)	$58.17	$57.50	$49.50	$43.83
Nonferrous				
Aluminum ingot	27.10	27.10	25.90	23.20
Copper, electrolytic	46.00	46.00	46.00	36.00
Lead, St. Louis	15.80	15.80	15.80	12.50
Magnesium	35.25	32.25	34.50	29.25
Nickel, electrolytic	64.50	64.50	64.50	67.67
Tin, Straits, N. Y.	99.625	98.75	95.75	96.00
Zinc, E. St. Louis	13.50	13.50	13.50	12.50

*Revised

New Pricing Setup For Bolts

Revised discount schedules are announced by two large producers . . . Broader spread designed to encourage distributor buying and warehousing . . . Move may influence others.

◆ A NEW PRICING structure for bolts, announced by both Russell, Burdsall & Ward Bolt and Nut Co. and Lamson & Sessions Co., will probably stimulate similar action by other producers.

The pricing plan, patterned after steel mill marketing practices, features establishment of quantity brackets with graduated discounts and adoption of a 2 pct cash discount on payment terms.

Broader spread of quantity discounts is designed to encourage distributors to purchase bolts in bigger lots and relieve the producer of warehousing expense. The 2 pct cash discount is something wholesalers have been pressing for.

In announcing the new pricing structure, Harry O. McCully, vice president in charge of sales for RB&W, described it as "an entirely new concept of marketing these products."

Price changes, according to Mr. McCully, vary according to the type and size of fastener and quantity ordered. "In one product grouping, prices actually are reduced 5.4 pct," he said. "The other extreme represents a 31 pct increase — in this case covering slow-moving sizes ordered in small quantities. The effect upon individual customer's prices will depend upon his product mix and method of buying." (For new discount percentages, see p. 130.)

A Lamson & Sessions spokesman says the new breakdown of quantity discounts and brackets "more logically fits the present distribution pattern and will strengthen the market for our industry and its distributors."

The 2 pct cash discount is double the previous allowance. It was adopted, Mr. McCully said, despite the fact that "we still can earn only ½ of 1 pct on our money in discounting our material invoices."

Quantity brackets established by RB&W are: 40,000-lb shipments, 20,000-lb shipments, 30-container shipments, full container quantities and less than full container lots. Former discount premiums still apply on orders for less than full container lots.

Mr. McCully, in an industry-wide sales review, indicated that 1956 would be another record year for fastener sales. Manufacturers in the first six months of 1956 increased sales volume at least 5 pct over the first half of 1955, he stated. He adds:

"Sales of high tensile bolts for construction will continue to climb. On an industry-wide basis, automakers are expected to increase orders with model changeovers. Next year should see the upturn in farm equipment industry business gain momentum. Appliance and home building sales have been down a little, but capital equipment manufacturers and general industrial users are making up the difference."

Purchasing Agent's Checklist

SURVEY REPORT: How to Hit Your Marketing Target . . . . . p. 53

WEST COAST: Selling the West is not as simple as it seems . . . p. 46

MARKETING: Welding equipment sales are running strong . . . . p. 48

MACHINE TOOLS: Shipments are up, orders have fallen off . . . p. 73

SHEETS AND STRIPS . . . Producers of flat rolled products in the **Cleveland** area report occasional calls from plants in distress. In **Pittsburgh** the outlook is for a 6 to 8 week cut in fourth quarter bookings to make up for strike losses. Mill men in **Chicago** are guessing that fourth quarter will find cold-rolled strip demand below that of cold-rolled sheet. Stiff demand for cold-rolled sheet from automotive buyers is a probability. Every customer in the area is taking all the cold-rolled sheet he can get for December delivery. Hot-rolled sheet is tight. And even farm equipment companies are anxious about fourth quarter sheet allotments. Mill men are talking capacity operation on both hot- and cold-rolled sheets through the fourth and first quarters and perhaps beyond.

PLATE AND STRUCTURALS . . . **Pittsburghers** feel the worst is still to come in structural supply. On future jobs demanding large quantities of structurals, contractors say they are being quoted 12 month delivery. Unless the picture changes, there will be a decline in construction activity in the coming months. Very little plate or structural is coming through in the **Cleveland** area, according to word from the warehouses. There's heavy demand for structurals at **Chicago** with carryovers ranging up to 90 days. Warehouses are cleaned out. Foreign mills are unable to supply much more than light angles and light shapes with deliveries going into next year. In plate, foreign and conversion is in demand and will be through the first half of next year.

IRON ORE . . . Woodward Iron Co., Birmingham, cut back its previously announced $8.7 million expansion program by about $5 million. The cut in capital expenditures is described as due to changes in the company's ore procurement program. Woodward recently purchased the Muscoda iron ore mines of U. S. Steel's Coal & Iron Div. Purchase of these mines will enable Woodward to postpone development of its ore reserves near Wildwood, Ala., for about 10 or 12 years.

WAREHOUSES . . . **Pittsburgh** warehousemen have no plate or structurals to sell. Prime sheets are hard to keep in stock in **Cleveland**, but the balance of the flat rolled line remains dull. A mild pickup in sales at **Chicago** continues with high hopes for late in the fourth quarter, particularly in cold rolled sheet.

Comparison of Prices

(Effective Aug. 28, 1956)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

	Aug. 28 1956	Aug. 21 1956	July 31 1956	Aug. 30 1955
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	4.675¢	4.675¢	4.325¢	4.325¢
Cold-rolled sheets	5.75	5.75	5.325	5.325
Galvanized sheets (10 ga.)	6.30	6.30	5.85	5.85
Hot-rolled strip	4.675	4.675	4.325	4.325
Cold-rolled strip	6.870	6.870	6.28	6.29
Plate	4.87	4.87	4.52	4.52
Plates, wrought iron	10.40	10.40	10.40	9.30
Stainl's C-R strip (No. 302)	47.50	47.50	44.50	44.50
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	$9.85	$9.85	$9.85	$9.05
Tinplates, electro (0.50 lb.)	8.55	8.55	8.55	7.75
Special coated mfg. ternes	9.10	9.10	9.10	7.85
Bars and Shapes: (per pound)				
Merchant bars	5.075¢	5.075¢	4.65¢	4.65¢
Cold finished bars	6.85	6.85	5.90	5.90
Alloy bars	6.125	6.125	5.65	5.65
Structural shapes	5.00	5.00	4.60	4.60
Stainless bars (No. 302)	40.75	40.75	38.25	38.25
Wrought iron bars	11.50	11.50	11.50	10.40
Wire: (per pound)				
Bright wire	7.20¢	7.20¢	6.60¢	6.25¢
Rails: (per 100 lb.)				
Heavy rails	$5.075	$5.075	$4.725	$4.725
Light rails	6.00	6.00	5.65	5.65
Semifinish Steel: (per net ton)				
Rerolling billets	$74.00	$74.00	$68.50	$68.50
Slabs, rerolling	74.00	74.00	68.50	68.50
Forging billets	91.50	91.50	84.50	84.50
Alloy blooms, billets, slabs	107.00	107.00	96.00	96.00
Wire Rod and Skelp: (per pound)				
Wire rods	5.80¢	5.80¢	5.025¢	5.025¢
Skelp	4.225	4.225	4.225	4.225
Finished Steel Composite: (per pound)				
Base price	5.622¢	5.622¢	5.179¢	5.174¢

	Aug. 28 1956	Aug. 21 1956	July 31 1956	Aug. 30 1955
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$67.76	$67.76	$66.51	$63.69
Foundry, Valley	63.00	63.00	60.50	59.00
Foundry, Southern Cin'ti	67.17	67.17	62.93	62.93
Foundry, Birmingham	59.00	59.00	57.67	55.00
Foundry, Chicago	63.00	63.00	63.00	59.00
Basic del'd Philadelphia	66.84	66.84	65.73	62.77
Basic, Valley furnace	62.50	62.50	60.00	58.50
Malleable, Chicago	63.00	63.00	63.00	59.00
Malleable, Valley	63.00	63.00	60.50	59.00
Ferromanganese, cents per lb.‡ 74 to 76 pct Mn base.	10.75¢	10.75¢	10.75¢	9.50¢
Pig Iron Composite: (per gross ton)				
Pig iron	$63.04*	$63.15	$61.36	$59.09
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$58.50	$57.50	$55.00	$44.50
No. 1 steel, Phila. area	58.50	57.50	52.00	46.50
No. 1 steel, Chicago	57.50	57.50	50.50	40.50
No. 1 bundles, Detroit	55.50	54.50	51.50	38.50
Low phos., Youngstown	65.50	65.50	57.50	47.50
No. 1 mach'y cast, Pittsburgh	60.50	60.50	55.50	45.50
No. 1 mach'y cast, Philadel'a	58.00	57.50	55.50	46.50
No. 1 mach'y cast, Chicago	59.50	59.50	54.50	52.50
Steel Scrap Composite: (per gross ton)				
No. 1 heavy melting scrap	$58.17	$57.50	$52.67	$43.83
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.50	$14.50	$14.50	$13.25
Foundry coke, prompt	$17-18	$17-18	17.50	16.25
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	40.00	40.00	46.00	43.00
Copper, Lake, Conn.	40.00	40.00	46.00	40.00
Tin, Straits, New York	*99.625*†	98.75	100.25	95.625
Zinc, East St. Louis	13.50	13.50	13.50	12.50
Lead, St. Louis	15.80	15.80	15.80	14.80
Aluminum, virgin ingot	27.10	27.10*	25.90	23.20
Nickel, electrolytic	64.50	64.50	64.50	67.67
Magnesium, ingot	35.25	35.25*	34.50	29.25
Antimony, Laredo, Tex.	33.00	33.00	33.00	28.50

† Tentative. ‡ Average. * Revised.

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

←To identify producers, see Key on p. 128→

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Bethlehem *B3*	64.50	65.00	65.50	66.00	.....
Birdsboro, Pa. *B6*	64.50	65.00	65.50	66.00	.....
Birmingham *R3*	58.50	59.00	.....	.....	.....
Birmingham *W9*	58.50	59.00	63.00	.....	.....
Birmingham *U4*	58.50	59.00	63.00	.....	.....
Buffalo *R3*	62.50	63.00	63.50	64.00	.....
Buffalo *H1*	62.50	63.00	63.50	.....	.....
Buffalo *W6*	62.50	63.00	63.50	64.00	.....
Chester *P2*	64.50	65.00	65.50	.....	.....
Chicago *I4*	62.50	63.00	63.00	63.50	.....
Cleveland *A5*	62.50	63.00	63.00	63.50	67.50
Cleveland *R3*	62.50	63.00	63.00	63.50	.....
Duluth *I4*	62.50	63.00	63.00	63.50	67.50
Erie *I4*	62.50	63.00	63.00	63.50	67.50
Everett *M6*	.....	63.75	64.25	.....	.....
Fontana *K1*	70.00	70.50	.....	.....	.....
Geneva, Utah *C7*	60.00	60.50	.....	.....	.....
Granite City *G2*	64.40	64.90	65.40	.....	.....
Hubbard *Y1*	.....	.....	63.00	.....	.....
Midland *C11*	62.50	.....	.....	.....	.....
Minnequa *C6*	64.50	65.00	65.50	.....	.....
Monessen *P6*	60.00	.....	.....	.....	.....
Neville Is. *P4*	62.50	63.00	63.00	63.50	67.50†
N. Tonawanda *T1*	.....	63.00	63.50	64.00	.....
Pittsburgh *U1*	62.50	.....	63.00	63.50	.....
Sharpsville *S3*	62.50	63.00	63.00	63.50	.....
So. Chicago *R3*	62.50	63.00	63.00	.....	.....
Steelton *B3*	64.50	65.00	65.50	66.00	70.50
Swedeland *A2*	64.50	65.00	65.50	65.50	.....
Toledo *I4*	62.50	63.00	63.00	63.50	.....
Troy, N. Y. *R3*	64.50	65.00	65.50	66.00	70.50
Youngstown *Y1*	62.50	63.00	63.00	63.50	.....

DIFFERENTIALS: Add, 50¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.50 pct manganese or portion thereof over 1 pct, $2 per ton for 0.5 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. * Add $1.00 for 0.31-0.69 pct phos. † Intermediate low phos.

Silvery Iron: Buffalo, *H1*, $72.50; Jackson, *J1*, *I4*, $71.00; Niagara Falls, $94.50. Add $1.25 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct.) up to 14 pct. Add 75¢ for each 0.50 pct manganese over 1.0 pct. Bessemer ferrosilicon: $64.00.

STAINLESS STEEL

Base price cents per lb. f.o.b. mill.

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	19.75	21.00	20.50	22.00	—	23.25	35.25	28.25	32.75	—	16.00	27.75	16.25
Slabs, billets	24.50	27.25	25.25	28.00	28.50	29.25	44.50	35.75	42.00	—	20.75	—	21.00
Billets, forging	—	33.00	33.75	34.00	37.00	36.00	56.25	42.25	50.25	30.75	27.25	27.75	27.75
Bars, struct.	39.00	39.25	40.50	40.75	43.75	43.00	66.75	50.25	59.00	36.25	32.50	33.00	33.00
Plates	—	41.25	42.50	43.00	45.50	45.75	70.25	54.50	63.75	38.75	33.75	34.50	34.50
Sheets	45.00	45.25	47.25	47.50	—	50.25	74.75	60.00	73.00	—	38.75	46.50	39.25
Strip, hot-rolled	33.00	35.75	34.00	36.75	—	39.75	63.50	48.75	58.25	—	29.75	—	30.75
Strip, cold-rolled	41.50	45.25	43.75	47.50	52.00	50.25	74.75	60.00	73.00	—	38.75	46.50	39.25
Wire CF; Rod HR	—	37.25	38.50	38.75	41.75	41.00	63.75	48.00	56.25	34.50	31.00	31.50	31.50

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11*; Brackenridge, Pa., *A3*; Butler, Pa., *A7*; Vandergrift, Pa., *U1*; Washington, Pa., *W2* (2.25¢ lower on Type 430), *J2*; Baltimore, *E1*; Middletown, O., *A7*) Massillon, O., *R3*; Gary, *U1*; Bridgeville, Pa., *U2*; New Castle, Ind., *I2*; Ft. Wayne, *J4*; Philadelphia, *D5*.

Strip: Midland, Pa., *C11*; Waukegan, Cleveland, *A5*; Carnegie, Pa., *S9*; McKeesport, Pa., *F1*; Reading, Pa., *C2*; Washington, Pa., *W2*; W. Leechburg, Pa., *A3*; Bridgeville, Pa., *U2*; Detroit, *M2*; Canton-Massillon, O., *R3*; Harrison, N. J., *D3*; Youngstown, *C5*; Sharon, Pa., *S1*; Butler, Pa., *A7*; Wallingford, Conn., *U3* (.25¢ per lb higher); *W1* (.25¢ per lb higher); New Bedford, Mass., *R6*; Gary, *U1* (.25¢ per lb higher).

Bar: Baltimore, *A7*; S. Duquesne, Pa., *U1*; Munhall, Pa., *U1*; Reading, Pa., *C2*; Titusville, Pa., *U2*; Washington, Pa., *J2*; McKeesport, Pa., *U1*, *F1*; Bridgeville, Pa., *U2*; Dunkirk, N. Y., *A3*; Massillon, O., *R3*; S. Chicago, *U1*; Syracuse, N. Y., *C11*; Watervliet, N. Y., *A3*; Waukegan, *A5*; Canton, O., *T5*; Ft. Wayne, *I4*; Philadelphia, *D5*; Detroit, *R5*; Gary, *U1*.

Wire: Waukegan, *A5*; Massillon, O., *R3*; McKeesport, Pa., *F1*; Ft. Wayne, *J4*; Harrison, N. J., *D3*; Baltimore, *A7*; Dunkirk, *A3* (.25¢ per lb lower on Types 301, 303 and 316); Monessen, *P1*; Syracuse, *C11*; Bridgeville, *U2*.

Structurals: Baltimore, *A7*; Massillon, O., *R3*; Chicago, Ill., *J4*; Watervliet, N. Y., *A3*; Syracuse, *C11*; S. Chicago, *U1*.

Plates: Brackenridge, Pa., *A3*; Chicago, *U1*; Munhall, Pa., *U1*; Midland, Pa., *C11*; New Castle, Ind., *I2*; Middletown, *A7*; Washington, Pa., *J2*; Cleveland, Massillon, *R3*; Coatesville, Pa., *C15*; Philadelphia, *D5*; Vandergrift, Pa., *U1*; Gary, *U1*.

Forging billets: Midland, Pa., *C11*; Baltimore, *A7*; Washington, Pa., *J2*; McKeesport, *F1*; Massillon, Canton, O., *R3*; Watervliet, *A3*; Pittsburgh, Chicago, *U1*; Syracuse, *C11*; Detroit, *R5*; Munhall, Pa., S. Chicago, *U1*.

Scrap Prices Continue Climb

Mills resist price levels but without much success so far . . . Export a big factor in Coast markets . . . Closing of auto lists this week should show market tone.

♦ALTHOUGH there is a lot of talk about mill resistance, it remains mostly talk as scrap prices continued to climb in most market areas.

In the Midwest, mills put up a more stubborn front and prices held steady in some markets. But even there the predictions were for somewhat higher prices and broker buying prices were often in advance of mill quotations.

Most of the strength that continues to result in weekly new all-time highs is based on a solid domestic demand. However, particularly on the three coasts, a strong export market helps bull the price levels.

Export can be called a major, if not dominant, factor in the market. Demand is heavy from all parts of the world. Europe and the United Kingdom remain prime markets, while Japan and Canada have been stepping up in recent months.

Most of the trade agrees that even a sudden slump in export would have little effect in softening prices. If this should happen, any surplus in the East would probably take the water route to Midwest mills.

While export is certainly a prime factor in No. 1 steel quotations, many in the trade believe that the No. 2 tonnages which are allowed in mixed cargoes carry the real profit.

Although there is continuous talk of possible tighter controls, talk of a possible fourth quarter embargo on scrap exports is discounted by most sources.

Pittsburgh . . . A major mill has purchased openhearth scrap at $59.00 for No. 1 heavy melting, $52.00 for No. 2 heavy melting, and $48.00 for No. 2 bundles. The purchase raised prices of these grades $1 to $2. It tightens the squeeze on brokers who are still trying to fill orders for No. 1 at $51.00. Brokers are finding it difficult to get shipment of No. 2 grades even at the new prices. An area mill is attempting to buy turnings at $42.00 but is having difficulty. Most brokers are holding out for $2 more. Railroad grades continue strong. Cast is unchanged.

Chicago . . . In the face of strong mill resistance, the Chicago market held level through the week, as one mill withdrew an earlier offer and several offers to sell at new prices were refused. An attempted mill buy of No. 2 dealer bundles at $44.00 was refused, and broker buying prices of the grade at $45.00 are being reported. Turnings also continue to hang fire, but at least one mill attempt to buy turnings at existing price levels has been refused.

Philadelphia . . . All grades showed additional strength. On the basis of representative transactions, steelmaking grades are $1 higher, $59.00 for No. 1 heavy melting. Premium grades were up $1 to $2, with some cast grades also up $2. Export market is more active, having more of an affect than usual. However, there are indications that generation of scrap is recovering from the usual summer doldrums.

New York . . . Strong domestic demand plus continuing heavy export shipments have boosted all scrap grades. No. 1 heavy melting is now moving at $53.00, short shoveling turnings are as much as $40.00 and machinery cast is up to $50.00. Advanced cast prices reflect buying from steel mills apparently because of lack of hot metal.

Detroit . . . With auto lists expected to show further advances in the light of current scrap scarcity, broker buying prices began to advance. Minor advances indicated probable greater strength in the market before the end of the week, despite strong buyer resistance. Extreme resistance to current Detroit scrap levels, which have exceeded historical relationships with other areas, prompted some caution.

Cleveland . . . Market strength is largely in primary grades with dealer material a weak second to production scrap. But some secondary material will start moving into the Valley on expected orders there. Only significant sale last week was a tonnage of blast furnace grades to a fringe area mill. Auto lists closing this week are expected to go for a few dollars over present levels.

Birmingham . . . The domestic market is quiet but strong and export is very strong, with a price of $55 a ton for No. 1 steel reported at some ports. The cast market also remains strong, with consumers paying for long freight hauls.

St. Louis . . . Because of maintenance furnace work, the steel operating rate dropped to the lowest point since last July. The market continues strong, and railroad lists brought higher prices which were reflected in rail locomotive tires, angles and splice bars and RR specialties.

Cincinnati . . . Dealer yards are low since most area mills continued to work through the strike. Dealers hope to pick up collections at the end of vacation season. Local production lists closing this week will be best immediate gage of the market.

Buffalo . . . Prices remain unchanged in an inactive market. Strength still underlies the market and scrap yards still have scanty supplies. No major sales are expected until after Labor Day.

Boston . . . Export is booming the market in New England. The market is very strong for both openhearth and blast furnace grades, with turnings up $1 on the basis of new purchases.

West Coast . . . Export activity is increasing at Coast ports as Japanese demand for scrap gains strength. Mills are also stepping up activity, but prices are holding to present levels. Because of a typographical error, prices of shoveling turnings and machine shop turnings were incorrect in the Aug. 23 issue. Correct prices were $27 for shoveling turnings, $25 for machine shop turnings.

A
SYMBOL
OF
LEADERSHIP
IN
IRON & STEEL
SCRAP
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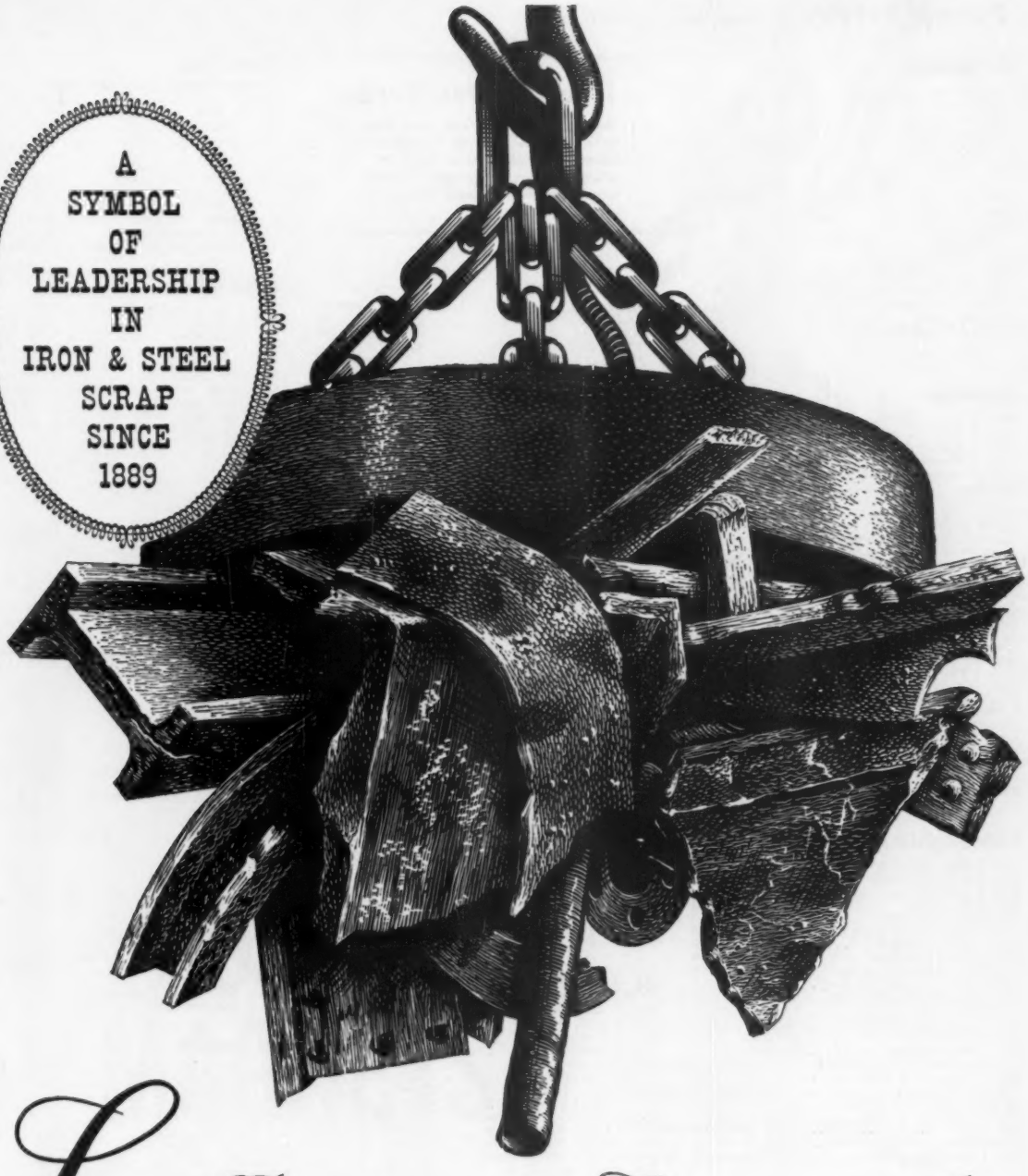
1889



Luria Brothers and Company, Inc.

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PHILADELPHIA NATIONAL BANK BLDG.
Philadelphia 7, Penna.

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EXPORTS-IMPORTS LIVINGSTON & SOUTHARD, INC. 99 Park Ave., New York, N. Y. *Cable Address:* **FORENTRACO**

Scrap Prices *(Effective Aug. 28, 1956)*

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$58.00 to $59.00
No. 2 hvy. melting	51.00 to 52.00
No. 1 bundles	58.00 to 59.00
No. 2 bundles	47.00 to 48.00
Machine shop turn.	38.00 to 39.00
Mixed bor. and ms. turn.	38.00 to 39.00
Shoveling turnings	42.00 to 43.00
Cast iron borings	42.00 to 43.00
Low phos. punch'gs plate	67.00 to 68.00
Heavy turnings	54.00 to 55.00
No. 1 RR hvy. melting	67.00 to 68.00
Scrap rails, random lgth.	72.00 to 73.00
Rails 2 ft and under	75.00 to 76.00
RR. steel wheels	73.00 to 74.00
RR. spring steel	73.00 to 74.00
RR. couplers and knuckles	73.00 to 74.00
No. 1 machinery cast	60.00 to 61.00
Cupola cast	53.00 to 54.00
Heavy breakable cast.	51.00 to 52.00

Chicago

No. 1 hvy. melting	$57.00 to $58.00
No. 2 hvy. melting	47.00 to 48.00
No. 1 factory bundles	63.00 to 65.00
No. 1 dealers' bundles	57.00 to 58.00
No. 2 dealers' bundles	43.00 to 44.00
Machine shop turn.	33.00 to 35.00
Mixed bor. and turn.	35.00 to 36.00
Shoveling turnings	35.00 to 36.00
Cast iron borings	35.00 to 36.00
Low phos. forge crops	72.00 to 73.00
Low phos. punch'gs plate	69.00 to 70.00
Low phos. 3 ft and under	67.00 to 68.00
No. 1 RR. hvy. melting	62.00 to 64.00
Scrap rails, random lgth.	73.00 to 74.00
Rerolling rails	84.00 to 85.00
Rails 2 ft and under	82.00 to 83.00
Locomotive tires, cut	68.00 to 69.00
Cut bolsters & side frames	68.00 to 69.00
Angles and splice bars	73.00 to 74.00
RR. steel car axles	87.00 to 88.00
RR. couplers and knuckles	67.00 to 68.00
No. 1 machine cast	59.00 to 60.00
Cupola cast	55.00 to 56.00
Heavy breakable cast.	48.00 to 49.00
Cast iron brake shoe	49.00 to 50.00
Cast iron wheel	60.00 to 61.00
Malleable	72.00 to 73.00
Stove plate	50.00 to 51.00
Steel car wheels	68.00 to 69.00

Philadelphia Area

No. 1 hvy. melting	$58.00 to $59.00
No. 2 hvy. melting	49.00 to 50.00
No. 1 bundles	58.00 to 59.00
No. 2 bundles	47.00 to 48.00
Machine shop turn.	40.00 to 41.00
Mixed bor. short turn.	40.00 to 41.00
Cast iron borings	40.00 to 41.00
Shoveling turnings	44.00 to 45.00
Clean cast chem. borings	43.00 to 44.00
Low phos. 5 ft and under	60.00 to 61.00
Low phos. 2 ft and under	62.00 to 63.00
Low phos. punch'gs	62.00 to 63.00
Elec. furnace bundles	60.00 to 61.00
Heavy turnings	54.00 to 55.00
RR. steel wheels	67.00 to 68.00
RR. spring steel	67.00 to 68.00
Rails 18 in. and under	72.00 to 73.00
Cupola cast	55.00 to 56.00
Heavy breakable cast.	55.00 to 56.00
Cast iron car wheels	64.00 to 65.00
Malleable	68.00 to 69.00
Unstripped motor blocks	35.00 to 36.00
No. 1 machinery cast	57.00 to 59.00

Cleveland

No. 1 hvy. melting	$61.50 to $62.50
No. 2 hvy. melting	47.00 to 48.00
No. 1 bundles	61.50 to 62.50
No. 2 bundles	40.00 to 41.00
No. 1 busheling	61.50 to 62.50
Machine shop turn.	32.50 to 33.50
Mixed bor. and turn.	38.00 to 39.00
Shoveling turnings	38.00 to 39.00
Cast iron borings	38.00 to 39.00
Cut struct'r'l & plates, 2 ft & under	67.00 to 68.00
Drop forge flashings	62.50 to 63.50
Low phos. punch'gs, plate	62.50 to 63.50
Foundry steel, 2 ft & under	56.00 to 57.00
No. 1 RR. heavy melting	66.00 to 67.00
Rails 2 ft and under	80.00 to 81.00
Rails 18 in. and under	81.00 to 82.00
Railroad grate bars	47.00 to 48.00
Steel axle turnings	44.00 to 45.00
Railroad cast	60.00 to 61.00
No. 1 machinery cast	57.00 to 58.00
Stove plate	54.00 to 55.00
Malleable	70.00 to 71.00

Youngstown

No. 1 hvy. melting	$64.00 to $65.00
No. 2 hvy. melting	47.00 to 48.00
No. 1 bundles	64.00 to 65.00
No. 2 bundles	43.00 to 44.00
Machine shop turn.	34.00 to 35.00
Shoveling turnings	39.00 to 40.00
Cast iron borings	39.00 to 40.00
Low phos. plate	65.00 to 66.00

Buffalo

No. 1 hvy. melting	$54.00 to $55.00
No. 2 hvy. melting	43.00 to 44.00
No. 1 busheling	54.00 to 55.00
No. 1 bundles	54.00 to 55.00
No. 2 bundles	40.00 to 41.00
Machine shop turn.	30.00 to 31.00
Mixed bor. and turn.	32.00 to 33.00
Shoveling turnings	34.00 to 35.00
Cast iron borings	32.00 to 33.00
Low phos. plate	59.00 to 60.00
Scrap rails, random lgth.	57.00 to 58.00
Rails 2 ft and under	65.00 to 66.00
RR. steel wheels	60.00 to 61.00
RR. spring steel	60.00 to 61.00
RR. couplers and knuckles	62.00 to 63.00
No. 1 machinery cast	52.00 to 53.00
No. 1 cupola cast	48.00 to 49.00

Detroit

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$54.00 to $55.00
No. 2 hvy. melting	42.00 to 43.00
No. 1 bundles, openhearth	55.00 to 56.00
No. 2 bundles	35.00 to 36.00
New busheling	53.00 to 54.00
Drop forge flashings	52.50 to 53.50
Machine shop turn.	29.00 to 30.00
Mixed bor. and turn.	32.00 to 33.00
Shoveling turnings	32.00 to 33.00
Cast iron borings	32.00 to 33.00
Low phos. punch'gs, plate	53.00 to 54.00
No. 1 cupola cast	51.00 to 52.00
Heavy breakable cast.	44.00 to 45.00
Stove plate	45.00 to 46.00
Automotive cast	54.00 to 55.00

St. Louis

No. 1 hvy. melting	$51.00 to $52.00
No. 2 hvy. melting	42.50 to 43.50
No. 1 bundles	53.00 to 54.00
No. 2 bundles	38.00 to 39.00
Machine shop turn.	32.00 to 33.00
Cast iron borings	33.00 to 34.00
Shoveling turnings	33.00 to 34.00
No. 1 RR. hvy. melting	61.50 to 62.50
Rails, random lengths	75.00 to 76.00
Rails 18 in. and under	79.00 to 80.00
Locomotive tires uncut	65.00 to 66.00
Angles and splice bars	68.00 to 69.00
Std. steel car axles	80.00 to 81.00
RR. specialties	68.00 to 69.00
Cupola cast	54.00 to 55.00
Heavy breakable cast.	45.00 to 46.00
Cast iron brake shoes	50.00 to 51.00
Stove plate	48.00 to 49.00
Cast iron car wheels	53.00 to 54.00
Rerolling rails	82.00 to 83.00
Unstripped motor blocks	44.00 to 45.00

Boston

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$50.50 to $51.50
No. 2 hvy. melting	40.00 to 41.00
No. 1 bundles	50.50 to 51.50
No. 2 bundles	38.00 to 39.00
No. 1 busheling	50.50 to 51.50
Elec. furnace, 3 ft & under	53.00 to 54.00
Machine shop turn.	28.50 to 29.50
Mixed bor. and short turn.	28.50 to 29.50
Shoveling turnings	33.00 to 33.50
Clean cast chem. borings	31.00 to 32.00
No. 1 machinery cast	45.00 to 46.00
Mixed cupola cast	41.00 to 42.00
Heavy breakable cast.	44.00 to 45.00
Stove plate	39.00 to 40.00
Unstripped motor blocks	32.00 to 33.00

New York

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$52.00 to $53.00
No. 2 hvy. melting	43.00 to 44.00
No. 2 bundles	39.00 to 40.00
Machine shop turn.	32.00 to 33.00
Mixed bor. and turn.	32.00 to 33.00
Shoveling turnings	39.00 to 40.00
Clean cast chem. borings	29.00 to 30.00
No. 1 machinery cast	51.00 to 52.00
Mixed yard cast	47.00 to 48.00
Charging box cast	47.00 to 48.00
Heavy breakable cast.	47.00 to 48.00
Unstripped motor blocks	37.00 to 38.00

Birmingham

No. 1 hvy. melting	$42.00 to $43.00
No. 2 hvy. melting	40.00 to 41.00
No. 1 bundles	42.00 to 43.00
No. 2 bundles	34.00 to 35.00
No. 1 busheling	42.00 to 43.00
Machine shop turn.	29.00 to 30.00
Shoveling turnings	31.00 to 32.00
Cast iron borings	25.00 to 26.00
Electric furnace bundles	51.00 to 52.00
Bar crops and plate	55.00 to 56.00
Structural and plate, 2 ft	54.00 to 55.00
No. 1 RR. hvy. melting	50.00 to 51.00
Scrap rails, random lgth.	63.00 to 64.00
Rails, 18 in. and under	67.00 to 68.00
Angles & splice bars	64.00 to 65.00
Rerolling rails	71.00 to 72.00
No. 1 cupola cast	51.00 to 52.00
Stove plate	49.00 to 50.00
Charging box cast	38.00 to 39.00
Cast iron car wheels	39.00 to 40.00
Unstripped motor blocks	43.00 to 44.00
Mashed tin cans	15.00 to 16.00

Cincinnati

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$54.50 to $55.50
No. 2 hvy. melting	45.00 to 46.00
No. 1 bundles	54.50 to 55.50
No. 2 bundles	42.00 to 43.00
Machine shop turn.	32.50 to 33.50
Mixed bor. and turn.	34.50 to 35.50
Shoveling turnings	35.50 to 36.50
Cast iron borings	34.50 to 35.50
Low phos. 18 in. & under	59.00 to 60.00
Rails, random lengths	65.00 to 66.00
Rails, 18 in. and under	74.00 to 75.00
No. 1 cupola cast	47.00 to 48.00
Hvy. breakable cast.	47.00 to 48.00
Drop broken cast	58.00 to 59.00

San Francisco

No. 1 hvy. melting	....	$46.00
No. 2 hvy. melting	....	43.00
No. 1 bundles	....	44.00
No. 2 bundles	....	35.00
No. 3 bundles	....	29.00
Machine shop turn.	....	27.00
Cast iron borings	....	25.00
No. 1 RR. hvy. melting	....	46.00
No. 1 cupola cast	....	52.00

Los Angeles

No. 1 hvy. melting	....	$46.00
No. 2 hvy. melting	....	44.00
No. 1 bundles	....	45.00
No. 2 bundles	....	35.00
No. 3 bundles	....	33.00
Machine shop turn.	....	25.00
Shoveling turnings	....	27.00
Cast iron borings	....	24.00
Elec. furn. 1 ft and under	....	47.00
No. 1 RR. hvy. melting	....	46.00
No. 1 cupola cast	....	48.00

Seattle

No. 1 hvy. melting	....	$46.00
No. 2 hvy. melting	....	42.00
No. 2 bundles	....	31.00
No. 3 bundles	....	27.00
No. 1 cupola cast	....	45.00
Mixed yard cast	....	45.00

Hamilton, Ont.

No. 1 hvy. melting	....	$49.00
No. 2 hvy. melting	....	44.00
No. 1 bundles	....	49.00
No. 2 bundles	....	41.50
Mixed steel scrap	....	43.00
Bushelings	....	39.50
Bush., new fact., prep'd	....	47.00
Bush., new fact., unprep'd	....	43.00
Machine shop turn.	....	28.00
Short steel turn.	....	34.00
Mixed bor. and turn.	....	34.00
Rails, rerolling	....	57.00
Cast scrap	....	50.00

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OHIO MAGNETS

Size for size, Ohio Magnets lift larger loads over longer periods because they *operate cooler*. So for extra magnet lifting power, extra magnet value—always specify Ohio Magnets and Ohio Magnet Controllers. There's a type and size for every lifting job. Send for free copy of Bulletin 112, or consult the Yellow Pages for Ohio offices in principal cities.

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Ohio Also Makes Separation Magnets • Nail Making Machines • Fractional Horsepower, Shell and Torque Motors

Aluminum Is Still Tight

Federal Mediator reports Reynolds-USW pact is in line with Alcoa settlement . . . August aluminum output expected to be lowest since September 1951.

◆ REYNOLDS Metals is in process of resuming operations in its four smelters and five other plants, which were strike bound for 26 days over terms of a new contract.

Reynolds and the United Steel Workers came to agreement on a three-year pact which Clyde Mills, assistant director of the Federal Mediation Service, described as comparable to the contract signed previously by Aluminum Co. of America.

The four struck Reynolds smelters have a combined capacity of 6500 tons per week. Considering the time it will take to again reach full production, the strike will have cost Reynolds about 40,000 tons of metal. Alcoa's strike cost a similar amount.

This means that production of pig aluminum in August will be about 71,000 tons, lowest monthly output since September 1951.

Aluminum consumers will feel the strike for some time. Both Alcoa and Reynolds had mills as well as smelters shut down.

Alcoa mills that were idle were: Alcoa, Tenn.—sheet, plate, foil, powder, paste; Bridgeport, Conn. — castings; Detroit — castings; Edgewater, N. J. — sheet, foil, tube, impact extrusions; New Kensington, Pa.—tube, extrusions, foil, powder, paste, utensils; Richmond, Ind.—bottle caps.

Reynolds mills affected by the strike were: Phoenix, Ariz.—extrusions; McCook, Ill. — rolling mill (primarily sheet); La Grange, Ill.—utensils.

These mills will have backlogs of orders to varying degrees. Consumers will probably be able to get aluminum mill products. But there may be shortages in particular sizes, shapes, and alloys, at least through September.

ALUMINUM . . . Aluminum Co. of America has announced that it will install another potline at its Point Comfort, Tex., smelter. It will be the seventh at this plant, and is expected to boost capacity by about 20,000 tons. New line is expected to be in production by January 1958.

This, added to the additional capacity from the new Evansville, Ind. plant, will put Alcoa's total capacity at about 962,500 tons.

Power for the new line will come from radial engines fueled by natural gas. The cost is estimated at about $11 million.

COPPER . . . In this market as in aluminum, a strike is the big news. In this case it is the possibility, and no one seems to be very optimistic.

Kennecott Copper Corp. has offered the 800 men in its Garfield, Utah, refinery, represented by the United Steelworkers, a straight wage increase of 25¢ per hour over a three year period, and fringe benefits which would boost the package to 31¢. The union is pushing for a pact along the lines of the settlements in the steel and aluminum industry, which totaled 45.6¢.

The independent Mine, Mill & Smelter Workers Union, which represents over 10,000 Kennecott employees, has already signed a contract for about the same as Kennecott is now offering USW.

The company insists that it couldn't possibly give USW more than the Smelter Workers. And USW insists that it is following policy already established. Deadline is midnight, August 31.

NICKEL . . . Labor situation at International Nickel Co. has, temporarily, forced the supply outlook into the background. However, it doesn't look like it will add to the woes of nickel consumers.

The proposed new contract between the company and the International Mine, Mill & Smelter Workers of Canada was approved by workers in the Sudbury district, but rejected by workers in the Port Colborne refinery.

Neither local will sign until both are satisfied. But work is being continued, with the exception of a one-day show of strength at Port Colborne, during negotiations.

About 14,000 of the 16,000 workers affected are in the Sudbury district.

Settlement favored by Sudbury local calls for about 36¢ per hour in wage boosts and benefits over the next two years. Union estimates its cost to the company at about $9 million.

Workers at Port Colborne are insisting on a one-year pact with time-and-a-half for Saturday and Sunday.

TIN . . . The Malayan Tin Bureau reports that it expects the production and shipment of tin to be maintained despite problems ahead. Initially, a proposed strike of miners in Malaya would involve only 16,800 of the 40,000 total, and a third party, probably the government, is expected to step in. The dispute in Nigeria looks like it is headed for settlement. Workers have demanded the government establish a joint industrial council to protect their interests. This seems feasible, and a likely solution.

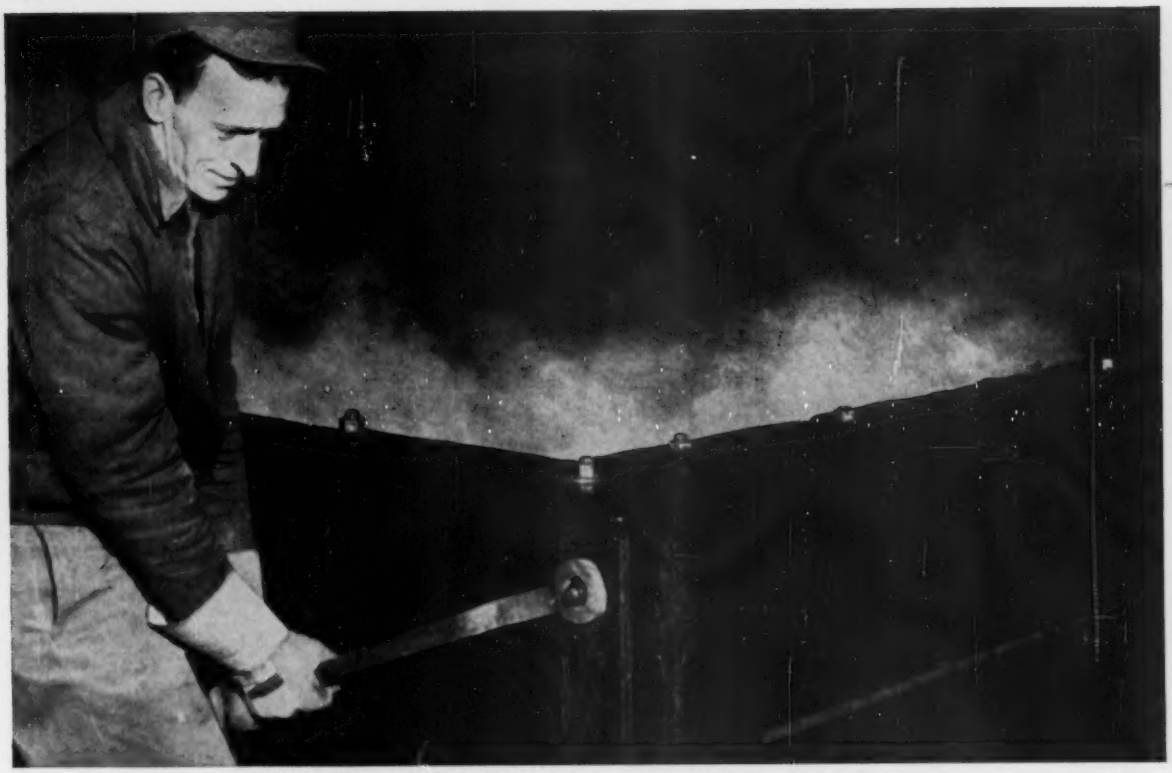
The Malayan Tin Bureau sees no immediate difficulty in the Egyptian nationalization of the Suez Canal, since Egypt needs the revenue it brings in.

Daily Nonferrous Metal Prices

(Cents per lb except as noted)

	Aug. 22	Aug. 23	Aug. 24	Aug. 25	Aug. 27	Aug. 28
Copper, electro, Conn.	40.00	40.00	40.00	40.00	40.00	40.00
Copper, Lake, delivered	40.00	40.00	40.00	40.00	40.00	40.00
Tin, Straits, New York	99.50	99.75	99.50	....	99.625	99.625*
Zinc, East St. Louis	13.50	13.50	13.50	13.50	13.50	13.50
Lead, St. Louis	15.80	15.80	15.80	15.80	15.80	15.80

Note: Quotations are going prices. **Tentative*



Pickling Department, Wheatland Tube Company, Wheatland, Pa., producers of quality steel pipe and tubing. Monel alloy tie-rods keep wood tanks tight; acid loss to a minimum.

Third time around for a Monel tie-rod ...and take-up threads still sound!

This man is tightening tie-rods on a pickling tank at the Wheatland Tube Company. They're Monel* nickel-copper alloy tie-rods. Many have outlasted two tanks and are now keeping their *third* tank tight ... leak-free!

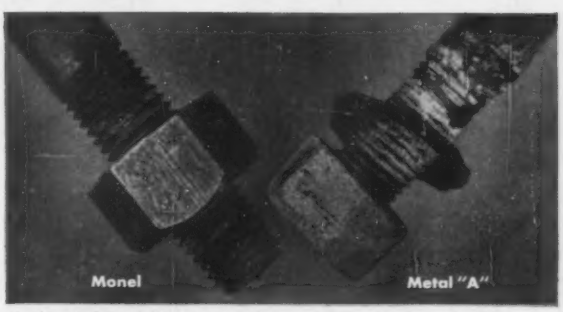
These tanks average four years' service. That means many of these Monel alloy tie-rods have lasted twelve years or more!

You save acid . . . save money when tanks stay tight

You can keep tanks tight with Monel alloy tie-rods. Monel alloy does not dezincify. Take-up threads stay *strong*. All *sound* metal. They hold up under tensions developed by tightening and by swelling timber. You can depend on that!

You can also count on the same dependability from other Monel pickling equipment. Chains, eyebars, pickle pins, and pipe, for example.

And this wrought Monel can be fabricated to any practical design. It's easily welded, too.



Look at this evidence that Monel threads stay sound. When you need take-up thread, you have it, on Monel tie-rods.

* * *

Pickling equipment suggestions available

A 32-page Inco booklet, "Equipping the Pickle House for Greater Production at Lower Cost", tells you how to take advantage of Monel in *your* pickling department. Filled with illustrations and performance information. Write for it today. *Registered Trademark

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INCO TRADE MARK **Monel... *for proved pickling life***

Nonferrous Prices *(Effective Aug. 28, 1956)*

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. ship. pt., frt. allowed)

Flat Sheet (Mill Finish) and Plate

("F" temper except 6061-0)

Alloy	.032	.081	.136-.249	.250-3.
1800,1100, 3003	44.3	42.1	40.9	40.2
5052	51.8	46.8	45.1	42.9
6061-0	48.9	44.6	42.8	42.6

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
6- 8	45.5-47.3	61.3-65.1
12-14	46.2-47.7	62.2-66.8
24-26	49.4-49.5	73.1-77.8
36-38	58.3-59.0	97.4-101.0

Screw Machine Stock—2011-T-3

Size*	¼	⅜-⅝	¾-1	1¼-1½
Price	59.7	58.8	57.4	55.2

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.019 gage	$1.352	$1.803	$2.254	$2.704
.024 gage	1.686	2.252	2.815	3.378

MAGNESIUM

(f.o.b. shipping pt., carload frt. allowed)

Sheet and Plate

Type→ Gage→	.250-3.00	.250-2.00	.188	.081	.032
AZ31B Stand. Grade	.....	67.9	69.0	77.9	103.1
AZ31B Spec.	.....	93.3	95.7	108.7	171.3
Tread Plate	.....	70.6	71.7	.....	.....
Tooling Plate	73.0	.....	.....	.....	.....

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade (AZ31C)	69.6	70.7	75.6	89.2
Spec. Grade (AZ31B)	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting) ..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	102	83	99
Strip, CR	102	92	125
Rod, Bar, HR	87	74	93
Angles, HR	87	74	93
Plate, HR	97	87	95
Seamless tube	122	110	153
Shot, blocks	...	71	...

COPPER, BRASS, BRONZE

(Freight included on 500 lbs)

	Sheet	Wire	Rod	Tube
Copper	61.63	.....	.....	61.83
Brass, 70/30	52.10	52.64	.....	55.01
Brass, Low	55.85	56.39	55.75	58.66
Brass, R L	57.19	57.73	57.13	60.00
Brass, Naval	55.72	.....	50.08	58.88
Munts Metal	53.84	47.85	49.65	.....
Comm. Ba.	59.08	59.62	59.02	61.84
Mang. Ba.	50.46	.....	53.56	.....
Phos. Ba. 5%	79.58	.....	80.08	.....

TITANIUM

(10,000 lb base, f.o.b. mill)

Sheet and strip, commercially pure, $12.10-$12.60; alloy, $15.00-$15.75; Plate, HR, commercially pure, $10.00-$10.50; alloy, $11.50-$12.00. Wire, rolled and/or drawn, commercially pure, $9.00-$11.50; alloy, $11.50; Bar, HR or forged, commercially pure, $7.55-$7.80; alloy, $7.55-$7.75.

PRIMARY METAL

(Cents per lb, unless otherwise noted)

Aluminum ingot, 98+%, 10,000 lb. freight alloyed 27.10
Aluminum pig 25.00
Antimony, American, Laredo, Tex. 33.50
Beryllium copper, per lb conta'd Be $43.00
Beryllium aluminum 5% Be, Dollars per lb contained Be $74.75
Bismuth, ton lots ..... $ 2.25
Cadmium, del'd ..... $ 1.70
Cobalt, 97-99% (per lb) .... $2.60 to $2.67
Copper, electro, Conn. Valley 40.00
Copper, Lake, delivered 40.00
Gold, U. S. Treas., per troy oz. $35.00
Indium, 99.9% dollars per troy oz. $ 2.25
Iridium, dollars per troy oz. ... $90 to $100
Lead, St. Louis 15.80
Lead, New York 16.00
Magnesium, 99.8+%, f.o.b. Velasco, Tex., 10,000 lb, pig 35.25
Ingot 36.00
Magnesium, sticks, 100 to 500 lb. ... 59.00
Mercury, dollars per 76-lb flask, f.o.b. New York ..... $255 to $257
Nickel electro 64.50
Nickel oxide sinter at Copper Cliff, Ont., contained nickel 60.75
Palladium, dollars per troy oz. .. $23 to $24
Platinum, dollars per troy oz. .$103 to $105
Silver, New York, cents per troy oz. 90.75
Tin, New York 99.625*
Titanium sponge, grade A-1, $2.70 to $3.00
Zinc, East St. Louis 13.50
Zinc, New York 14.00
Zirconium sponge $10.00
*Tentative.

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
No. 115 ..... 37.75
No. 120 ..... 36.50
No. 123 ..... 35.00
80-10-10 ingot
No. 305 ..... 41.00
No. 315 ..... 39.25
88-10-2 ingot
No. 210 ..... 52.75
No. 215 ..... 48.50
No. 245 ..... 43.50
Yellow ingot
No. 405 ..... 29.75
Manganese bronze
No. 421 ..... 33.00

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys
0.30 copper max. 28.25-29.00
0.60 copper max. 28.00-28.75
Piston alloys (No. 122 type) .. 27.75-28.75
No. 12 alum. (No. 2 grade) .. 26.50-27.50
108 alloy 27.00-27.50
195 alloy 27.50-28.50
13 alloy (0.60 copper max.) ... 28.00-28.75
AXS-679 ..... 27.00-27.50

Steel deoxidizing aluminum, notch bar granulated or shot

Grade 1—95-97½% 26.50-27.00
Grade 2—92-95% 25.50-26.00
Grade 3—90-92% 24.50-25.00
Grade 4—85-90% 24.00-24.50

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	36	35¼
Yellow brass	27¼	25½
Red brass	31⅛	31⅛
Comm. bronze	33½	32⅝
Mang. bronze	25¼	24½
Yellow brass rod ends	27	....

Custom Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 33½
No. 2 copper wire ..... 32 —32½
Light copper 30
*Refinery brass 30½
* Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 33½
No. 2 copper wire 32
Light copper 29½
No. 1 composition 30
No. 1 comp. turnings 29½
Hvy. yellow brass solids 20⅝
Brass pipe 21½
Radiators 22¾

Aluminum

Mixed old cast. ..... 18 —18½
Mixed new clips ..... 19 —20
Mixed turnings, dry ..... 18½—19

Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

Copper and Brass

No. 1 copper wire ..... 31 —31½
No. 2 copper wire ..... 28½—29½
Light copper ..... 26½—27
Auto radiators (unsweated) .. 19 —19½
No. 1 composition ..... 25½—26
No. 1 composition turnings .. 24 —24½
Unlined red car boxes ..... 20 —21½
Cocks and faucets ..... 19 —19½
Clean heavy yellow brass.... 17 —17½
Brass pipe ..... 20½—21
New soft brass clippings .... 22 —22½
No. 1 brass rod turnings .... 19½—20½

Aluminum

Alum. pistons and struts.... 8 — 8½
Aluminum crankcases ..... 13 —13½
1100 (2S) aluminum clippings 16 —16½
Old sheet and utensils..... 13 —13½
Borings and turnings ..... 9 — 9½
Industrial castings ..... 13 —13½
2024 (24S) clippings ..... 14½—15

Zinc

New zinc clippings..... 7½— 8
Old zinc ..... 4½— 5
Zinc routings ..... 2¾— 3
Old die cast scrap..... 2½— 2¾

Nickel and Monel

Pure nickel clippings ..... $1.85-$1.95
Clean nickel turnings ..... $1.55-$1.65
Nickel anodes ..... $1.85-$1.95
Nickel rod ends ..... $1.85-$1.95
New Monel clippings 80-90
Clean Monel turnings 70-80
Old sheet Monel 65-75
Nickel silver clippings, mixed 21
Nickel silver turnings, mixed 18

Lead

Soft scrap lead..... 12½—13
Battery plates (dry)..... 7 — 7¼
Batteries, acid free 4½

Miscellaneous

Block tin ..... 80 —81
No. 1 pewter..... 62½—63
Auto babbitt ..... 42 —42½
Mixed common babbitt ..... 13 —13½
Solder joints ..... 18 —18½
Siphon tops 42
Small foundry type..... 15¼—15½
Monotype ..... 14½—15
Lino. and stereotype..... 13 —13½
Electrotype ..... 12½—12¾
Hand picked type shells..... 10 —10½
Lino. and stereo. dross..... 5¼— 5¾
Electro. dross ..... 4¼— 4½

IRON AGE

STEEL PRICES

(Effective Aug. 28, 1956)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PILING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$107.00 *B3*		5.05 *B3*	7.40 *B3*	5.05 *B3*						
	Buffalo, N. Y.	$74.00 *B3*	$91.50 *B3, R3*	$107.00 *B3, R3*	5.90 *B3*	5.05 *B3*	7.40 *B3*	5.05 *B3*	4.675 *B3, R3*		6.95 *B3*			
	Claymont, Del.													
	Harrison, N. J.													14.55 *C11*
	Conshohocken, Pa.		$96.50 *A2*	$114.00 *A2*					4.725 *A2*	6.90 *A2*	6.95 *A2*			
	New Bedford, Mass.													
	Johnstown, Pa.	$74.00 *B3*	$91.50 *B3*	$107.00 *B3*		5.05 *B3*	7.40 *B3*							
	Boston, Mass.									7.40 *T8*				14.90 *T8*
	New Haven, Conn.									7.30 *A5*				
	Phoenixville, Pa.					5.85 *P2*		5.85 *P2*						
	Sparrows Pt., Md.								4.675 *B3*		6.95 *B3*			
	Bridgeport, Wallingford, Conn.	$79.00 *N8*	$96.50 *N8*							7.30 *W1* 6.95 *T8*				
	Pawtucket, R. I. Worcester, Mass.									7.40 *A5*				
MIDDLE WEST	Alton, Ill.								4.875 *L1*					
	Ashland, Ky.								4.675 *A7*					
	Canton-Massillon, Dover, Ohio		$91.50 *R3*	$107.00 *R3*										
	Chicago, Ill.	$74.00 *U1*	$91.50 *U1, R3,W8*	$107.00 *U1, R3,W8*	5.90 *U1*	5.00 *U1, W8*	7.35 *U1, Y1* 6.00 *W8*	5.00 *U1*	5.525 *N4* 4.675 *A1*	6.95 *A1*			7.75 *W8, S9*	14.55 *A1, S9,T8*
	Cleveland, Ohio									6.85 *A5,J3*			7.75 *J3*	
	Detroit, Mich.								4.775 *G3, M2*	6.95 *M2,G3, D2,P11*	7.05 *G3*	10.10 *G3, S1,D2*	7.05 *G3*	
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana	$74.00 *U1*	$91.50 *U1*	$107.00 *U1, Y1*	5.90 *I3*	5.00 *U1*	7.35 *U1,I3*	5.00 *I3*	4.675 *U1, I3,Y1*	6.85 *Y1*	6.95 *U1, I3,Y1*	10.20 *Y1*	7.75 *U1, Y1*	
	Sterling, Ill.								4.775 *N4*					
	Indianapolis, Ind.									7.00 *C5*				
	Newport, Ky.													
	Middletown, Ohio									6.85 *A7*				
	Niles, Warren, Ohio Sharon, Pa.		$91.50 *S1, C10*	$107.00 *S1 C10*					4.675 *S1, R3*	6.85 *T4*	6.95 *S1, R3*	10.00 *S1*	7.75 *S1*	14.55 *S1*
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	$74.00 *U1, J3*	$91.50 *U1, J3, C11*	$107.00 *U1, C11*	5.90 *U1*	5.00 *U1, J3*	7.35 *U1, J3*	5.00 *U1*	4.675 *P6*	5.750 *P6* 6.85 *J3,B4, S7*			7.75 *S9*	14.55 *S9*
	Portsmouth, Ohio													
	Weirton, Wheeling, Follansbee, W. Va.					5.00 *W3*			4.675 *W3*	6.85 *W3,F3*	6.95 *W3*	9.65 *W3*		
	Youngstown, Ohio		$91.50 *Y1, C10*	$107.00 *Y1*		5.00 *Y1*	7.35 *Y1*		4.675 *U1, Y1*	6.85 *Y1,C5*	6.95 *U1, Y1*	10.20 *Y1*	7.75 *U1, Y1*	
WEST	Fontana, Cal.	$83.50 *K1*	$101.00 *K1*	$128.00 *K1*		5.70 *K1*	8.05 *K1*	5.85 *K1*	5.475 *K1*	8.60 *K1*	9.725 *K1*			
	Geneva, Utah	$91.50 *C7*				5.00 *C7*	7.35 *C7*							
	Kansas City, Mo.					5.10 *S2*	7.45 *S2*		4.925 *S2*		7.20 *S2*		6.375 *S2*	
	Los Angeles, Torrance, Cal.		$101.00 *B2*	$127.00 *B2*		5.70 *C7, B2*	8.05 *B2*		5.425 *B2, C7*	8.90 *C1*			8.95 *B2*	
	Minnequa, Colo.					5.30 *C6*			5.775 *C6*					
	Portland, Ore.													
	San Francisco, Niles, Pittsburg, Cal.		$101.00 *B2*			5.65 *B2*	8.00 *B2*		5.425 *C7, B2*					
	Seattle, Wash.		$105.00 *B2*			5.75 *B2*	8.10 *B2*		5.675 *B2*					
SOUTH	Atlanta, Ga.								4.875 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$74.00 *T2*	$91.50 *T2*			5.00 *T2,R3* 5.30 *C16*	7.35 *T2*		4.675 *T2,R3* 4.975 *C16*		6.95 *T2*			
	Houston, Lone Star, Texas		$96.50 *S2*	$112.00 *S2*			7.45 *S2*				7.20 *S2*			

STEEL PRICES

(Effective Aug. 28, 1956)

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		SHEETS									WIRE ROD	TINPLATE†		BLACK PLATE
		Hot-rolled *18* ga. & hvyr.	Cold-rolled	Galvanized *10* ga.	Enameling *12* ga.	Long Terne *10* ga.	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot-rolled *19* ga.		Coke* *1.25*-lb. base box	Electro* *0.25*-lb. base box	Hollowware Enameling *29* ga.
EAST	Bethlehem, Pa.													
	Buffalo, N. Y.	4.675 *B3*	5.75 *B3*				6.90 *B3*	8.525 *B3*			5.80 *W6*	† Special coated mfg. terne deduct 50¢ from 1.25-lb. coke base box price. Can-making quality blackplate 55 to 128 lb. deduct $2.20 from 1.25 lb. coke base box. * COKES: 1.50-lb. add 25¢. ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb./0.25 lb. add 65¢.		
	Claymont, Del.													
	Conshohocken, Pa.	4.725 *A2*	5.80 *A2*				6.95 *A2*							
	Coatesville, Pa.													
	Harrisburg, Pa.													
	Hartford, Conn.													
	Johnstown, Pa.										5.80 *B3*			
	Fairless, Pa.	4.725 *U1*	5.80 *U1*				6.95 *U1*	8.575 *U1*				$9.70 *U1*	$8.40 *U1*	
	New Haven, Conn.													
	Phoenixville, Pa.													
	Sparrows Pt., Md.	4.675 *B3*	5.75 *B3*	6.30 *B3*			6.90 *B3*	8.575 *B3*	9.275 *B3*		5.90 *B3*	$9.70 *B3*		
	Worcester, Mass.										6.10 *A5*			
	Trenton, N. J.													
MIDDLE WEST	Alton, Ill.										6.00 *L1*			
	Ashland, Ky.	4.675 *A7*	5.75 *A7*	6.30 *A7*	6.325 *A7*									
	Canton-Massillon, Dover, Ohio			6.30 *R3*	6.325 *R3*									
	Chicago, Joliet, Ill.	4.675 *W8, A1*					6.90 *U1*			5.80 *K2*	5.80 *A5, R3, N4, W8*			
	Sterling, Ill.										5.90 *N4*			
	Cleveland, Ohio	4.675 *J3, R3*	5.75 *J3, R3*		6.325 *R3*		6.90 *R3*	8.525 *R3, J3*			5.80 *A5*			
	Detroit, Mich.	4.775 *G3*, M2	5.85 *G3* 5.75 *M2*				7.00 *G2*	8.625 *G3*						
	Newport, Ky.	4.675 *N5*	5.75 *N5*											
	Gary, Ind. Harbor, Indiana	4.675 *U1, I3, Y1*	5.75 *U1, I3, Y1*	6.30 *U1, I3*	6.325 *U1, I3, Y1*	6.70 *U1*	6.90 *U1, Y1, I3*	8.525 *U1, Y1*			5.80 *Y1*	$9.60 *U1, I3, Y1*	$8.30 *I3, U1, Y1*	7.15 *U1, Y1*
	Granite City, Ill.	4.875 *G2*	5.95 *G2*	6.50 *G2*	6.525 *G2*								$8.40 *G2*	7.25 *G2*
	Kokomo, Ind.			6.40 *C9*							5.90 *C9*			
	Mansfield, Ohio													
	Middletown, Ohio		5.75 *A7*	6.30 *A7*	6.325 *A7*	6.70 *A7*								
	Niles, Warren, Ohio Sharon, Pa.	4.675 *S1, R3, N3*	5.75 *R3*	6.30 *R3*	6.325 *N3*	6.70 *N3*	6.90 *S1, R3*	8.525 *S1, R3*					8.30 *R3*	
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	4.675 *U1, J3, P6*	5.75 *U1, J3, P6*	6.30 *U1, A7, J3*	6.325 *U1, A7*		6.90 *U1, J3, R3*	8.525 *U1, J3*	9.275 *U1*		5.80 *A5, P6, J3*	$9.60 *J3, U1*	$8.30 *U1*	7.15 *U1*
	Portsmouth, Ohio	4.675 *P7*	5.75 *P7*								5.80 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	4.675 *W3, W5*	5.75 *W3, W5, F3*	6.30 *W3, W5*		6.70 *W3, W5*	6.90 *W3*	8.525 *W3*				$9.60 *W5*	$8.30 *W5*	7.15 *W5* 7.40 *W3*
	Youngstown, Ohio	4.675 *U1, Y1*	5.75 *Y1*		6.325 *Y1*		6.90 *Y1*	8.525 *Y1*			5.80 *Y1*			7.15 *Y1*
WEST	Fontana, Cal.	5.475 *K1*	6.95 *K1*				7.70 *K1*	9.725 *K1*				$10.35 *K1*	$9.05 *K1*	$7.75 *K1*
	Geneva, Utah	4.775 *C7*												
	Kansas City, Mo.										6.05 *S2*			
	Los Angeles, Torrance, Cal.										6.60 *B2*			
	Minnequa, Colo.										6.05 *C6*			
	San Francisco, Niles, Pittsburg, Cal.	5.375 *C7*	6.70 *C7*	7.05 *C7*							6.45 *C7*	$10.35 *C7*	$9.05 *C7*	
	Seattle, Wash.													
SOUTH	Atlanta, Ga.													
	Fairfield, Ala. Alabama City, Ala.	4.675 *T2, R3*	5.75 *T2*	6.30 *T2, R3*						5.80 *R3*	5.80 *T2*	$9.70 *T2*	$8.40 *T2*	
	Houston, Tex.										6.05 *S2*			

STEEL PRICES

(Effective Aug. 28, 1956)

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		BARS						PLATES				WIRE
		Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem				6.125 *B3*	8.325 *B3*	7.40 *B3*					
	Buffalo, N. Y.	5.075 *B3,R3*	5.075 *B3,R3*	6.90 *B5*	6.125 *B3,R3*	8.325 *B5,B3*	7.40 *B3*	4.85 *B3*				7.20 *W6*
	Claymont, Del.							5.35 *C4*		6.85 *C4*	7.55 *C4*	
	Coatesville, Pa.							5.25 *L4*		6.85 *L4*	7.55 *L4*	
	Conshohocken, Pa.							4.90 *A2*	5.925 *A2*	6.25 *A2*	7.25 *A2*	
	Harrisburg, Pa.							5.80 *P2*	6.275 *C3*			
	Hartford, Conn.			7.35 *R3*		8.625 *R3*	7.40 *B3*					
	Johnstown, Pa.	5.075 *B3*	5.075 *B3*		6.125 *B3*			4.85 *B3*		6.85 *B3*	7.25 *B3*	7.20 *B3*
	Fairless, Pa.	5.225 *U1*	5.225 *U1*		6.275 *U1*							
	Newark, N. J.			7.30 *W10*		8.50 *W10*						
	Camden, N. J.			7.30 *P10*		8.50 *P10*						
	Bridgeport, Putnam, Conn.	5.30 *N8*	5.30 *N8*	7.20 *N8*	6.20 *N8*	8.475 *N8*						
	Sparrows Pt., Md.		5.075 *B3*					4.85 *B3*		6.85 *B3*	6.85 *B3*	7.30 *B3*
	Palmer, Worcester, Readville, Mass. Milton, Pa.	5.225 *M7*	5.225 *M7*	7.40 *B5* 7.40 *B5*		8.325 *A5* 8.625 *B5*						7.50 *A5,W6*
	Spring City, Pa.			7.30 *K4*		8.50 *K4*						
MIDDLE WEST	Alton, Ill.	5.275 *L1*										7.40 *L1*
	Ashland, Newport, Ky.							4.85 *A7,N5*		6.85 *N5*		
	Canton-Massillon, Mansfield, Ohio			6.85 *R3,R2*	6.125 *R3*	8.325 *R3,R2*						
	Chicago, Joliet, Ill.	5.075 *U1,R3, W8* 5.425 *N4* 5.575 *P13*	5.075 *U1,R3, N4* 5.575 *P13*	6.85 *A5,B5, W10,L2, W8, L2, N9*	6.125 *U1,R3, W8*	8.325 *A5,B5, W8,L2,N9, W10*	5.875 *W8*	4.85 *U1,I3, W8,A1*	5.925 *U1*	6.85 *U1,W8*	7.25 *U1*	7.20 *A5, R3,N4,W7*
	Cleveland, Ohio	5.075 *R3*	5.075 *R3*	6.85 *A5*		8.325 *A5*	7.425 *R3*	4.95 *J3,R3*	5.925 *J3*		7.25 *J3,R3*	7.20 *A5*
	Detroit, Mich.	5.175 *G3*	5.425 *G3*	7.05 *B5,P8* 7.10 *P3*	6.225 *G3*	8.525 *B5,P3, P8*	7.525 *G3*	4.95 *G3*		6.90 *G3*		
	Duluth, Minn.											7.20 *A5*
	Gary, Ind. Harbor, Crawfordsville	5.075 *U1,I3, Y1*	5.075 *U1,I3, Y1*	6.85 *R3,M5*	6.125 *U1,I3, Y1*	8.325 *R3,M4*	7.425 *U1,I3, Y1*	4.85 *U1,I3, Y1*	5.925 *I3*	6.85 *U1,Y1*	7.25 *U1,Y1*	7.30 *M4*
	Granite City, Ill.							5.05 *G2*				
	Kokomo, Ind.											7.30 *C9*
	Sterling, Ill.	5.525 *N4*	5.175 *N4*									
	Niles, Warren, Ohio Sharon, Pa.	5.075 *R3*		6.85 *C10,C11*	6.125 *C10,S1*	8.325 *C10*	7.425 *S1*	4.85 *S1,R3*		6.85 *S1*	7.25 *S1,R3*	
	Pittsburgh, Pa. Midland, Pa.	5.075 *U1, C11,J3*	5.075 *U1,J3*	6.85 *A5,C8, C11,J3,R3, S9,B4,W10*	6.125 *U1,C11*	8.325 *A5,R3, S9,C8,W10*	7.425 *U1,J3*	4.85 *U1,J3*	5.925 *U1*	6.85 *U1,J3*	7.25 *U1,J3*	7.20 *A5,J3, P6*
	Portsmouth, Ohio											8.40 *P7*
	Weirton, Wheeling, Follansbee, W. Va.							4.85 *W5*				
	Youngstown, Ohio	5.075 *U1, Y1,R3*	5.075 *U1, Y1,R3*	6.85 *U1,Y1, F2*	6.125 *U1,Y1*	8.325 *Y1,F2*	7.425 *U1,Y1*	4.85 *U1,Y1, R3*		6.85 *Y1*	7.25 *Y1*	7.20 *Y1*
WEST	Emeryville, Cal.											
	Fontana, Cal.	5.775 *K1*	5.575 *K1*		7.175 *K1*		8.125 *K1*	6.00 *K1*		8.00 *K1*	8.40 *K1*	
	Geneva, Utah	5.175 *C7*						4.85 *C7*			7.25 *C7*	
	Kansas City, Mo.	5.325 *S2*	5.325 *S2*		5.325 *S2*		7.675 *S2*					7.45 *S2*
	Los Angeles, Torrance, Cal.	5.775 *C7,B2*	5.775 *C7,B2*	8.30 *R3*	7.175 *B2*		8.125 *B2*					8.15 *B2*
	Minnequa, Colo.	5.525 *C6*	5.525 *C6*					5.70 *C6*				7.45 *C6*
	Portland, Ore.											
	San Francisco, Niles, Pittsburg, Cal.	5.775 *C7* 5.825 *B2*	5.775 *C7* 5.825 *B2*				8.175 *B2*					8.15 *C7,C6*
	Seattle, Wash.	5.825 *B2*	5.825 *B2*				8.175 *B2*	5.75 *B2*		7.75 *B2*	8.15 *B2*	
SOUTH	Atlanta, Ga.	5.575 *A8*										7.40 *A8*
	Fairfield, Ala. City, Birmingham, Ala.	5.075 *T2, R3* 5.375 *C16*	5.075 *T2, R3* 5.375 *C16*				7.425 *T2*	4.85 *T2, R3*			7.25 *T2*	7.20 *T2,R3*
	Houston, Ft. Worth, Lone Star, Tex.	5.325 *S2*	5.325 *S2*		6.375 *S2*		7.675 *S2*	4.95 *S2*		6.95 *S2*		7.45 *S2*

Steel Prices *(Effective Aug. 28, 1956)*

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angell Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brook Plant, Wickwire Spencer Steel Div., Birdsboro, Pa.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C5 Cold Metals Products Co., Youngstown, O.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C12 Cumberland Steel Co., Cumberland, Md.
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C17 Chester Blast Furnace, Inc., Chester, Pa.

D1 Detroit Steel Corp., Detroit
D2 Detroit Tube & Steel Div., Detroit
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.
D5 Henry Disston Div., Philadelphia

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.
F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid-States Steel & Wire Co., Crawfordsville, Ind.
M5 Monarch Steel Div., Hammond, Ind.
M6 Mystic Iron Works, Everett, Mass.
M7 Milton Steel Products Div., Milton, Pa.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N3 Niles Rolling Mill Div., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N5 Newport Steel Corp., Newport, Ky.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Northeastern Steel Corp., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P12 Pacific Steel Rolling Mills, Seattle
P13 Phoenix Mfg. Co., Joliet, Ill.

R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 Rotary Electric Steel Co., Detroit
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa
S9 Superior Steel Corp., Carnegie, Pa.
S10 Seneca Steel Service, Buffalo

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T6 Tremont Nail Co., Wareham, Mass.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W11 Worcester Pressed Steel Co., Worcester, Mass.
W12 Wallace Barnes Steel Div., Bristol, Conn.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½–3 In.		2 In.		2½ In.		3 In.		3½–4 In.	
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	10.50	+4.75	13.50	+0.75	16.00	2.75	18.50	3.50	19.00	4.50	19.50	5.00	21.00	4.75	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown *R3*	12.50	+2.75	15.50	1.25	18.00	4.75	20.50	5.50	21.00	6.50	21.50	7.00	23.00	6.75	.....	.....	.....	.....	.....	.....	.....	.....
Fontana *K1*	.....	+15.25	3.00	+11.25	5.50	+7.75	8.00	+4.00	8.50	+6.00	9.00	+5.50	10.50	+5.75	.....	.....	.....	.....	.....	.....	.....	.....
Pittsburgh *J3*	12.50	+2.75	15.50	1.25	18.00	4.75	20.50	5.50	21.00	6.50	21.50	7.00	23.00	6.75	+2.00	+17	4.50	+12.25	7.00	+9.75	8.50	+8.25
Alton, Ill. *L1*	10.50	+4.75	13.50	+0.75	16.00	2.75	18.50	3.50	19.00	4.50	19.50	5.00	21.00	4.75	.....	.....	.....	.....	.....	.....	.....	.....
Sharon *M3*	12.50	+2.75	15.50	1.25	18.00	4.75	20.50	5.50	21.00	6.50	21.50	7.00	23.00	6.75	.....	.....	.....	.....	.....	.....	.....	.....
Fairless *N2*	10.50	+4.75	13.50	+0.75	16.00	2.75	18.50	3.50	19.00	4.50	19.50	5.00	21.00	4.75	.....	.....	.....	.....	.....	.....	.....	.....
Pittsburgh *N1*	12.50	+2.75	15.50	1.25	18.00	4.75	20.50	5.50	21.00	6.50	21.50	7.00	23.00	6.75	+2.00	+17	4.50	+12.25	7.00	+9.75	8.50	+8.25
Wheeling *W5*	12.50	+2.75	15.50	1.25	18.00	4.75	20.50	5.50	21.00	6.50	21.50	7.00	23.00	6.75	.....	.....	.....	.....	.....	.....	.....	.....
Wheatland *W4*	12.50	+2.75	15.50	1.25	18.00	4.75	20.50	5.50	21.00	6.50	21.50	7.00	23.00	6.75	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown *Y1*	12.50	+2.75	15.50	1.25	18.00	4.75	20.50	5.50	21.00	6.50	21.50	7.00	23.00	6.75	+2.00	+17	4.50	+12.25	7.00	+9.75	8.50	+8.25
Indiana Harbor *Y1*	11.50	+5.75	14.50	1.25	17.00	3.75	19.50	4.50	20.00	5.50	20.50	6.00	22.00	5.75	.....	.....	.....	.....	.....	.....	.....	.....
Lorain *N2*	12.50	+2.75	15.50	1.25	18.00	4.75	20.50	5.50	21.00	6.50	21.50	7.00	23.00	6.75	+2.00	+17	4.50	+12.25	7.00	+9.75	8.50	+8.25
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	15.00	1.25	19.00	5.25	21.00	8.75	21.50	7.50	22.00	8.50	22.50	9.00	23.00	7.75	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown *R3*	17.00	3.25	21.00	7.25	23.00	10.75	23.50	9.75	24.00	10.50	24.50	11.00	25.00	9.75	.....	.....	.....	.....	.....	.....	.....	.....
Fairless *N2*	15.00	1.25	19.00	5.25	21.00	8.75	21.50	7.50	22.00	8.50	22.50	9.00	23.00	7.75	.....	.....	.....	.....	.....	.....	.....	.....
Fontana *K1*	4.50	.....	8.50	.....	10.50	.....	11.00	.....	11.50	.....	12.00	.....	12.50	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pittsburgh *J3*	17.00	3.25	21.00	7.25	23.00	10.75	23.50	9.75	24.00	10.50	24.50	11.00	25.00	9.75	+0.50	+14.50	7.00	+8.75	9.50	+6.25	14.50	+1.25
Alton, Ill. *L1*	15.00	1.25	19.00	5.25	21.00	8.75	21.50	7.50	22.00	8.50	22.50	9.00	23.00	7.75	.....	.....	.....	.....	.....	.....	.....	.....
Sharon *M3*	17.00	3.25	21.00	7.25	23.00	10.75	23.50	9.75	24.00	10.50	24.50	11.00	25.00	9.75	.....	.....	.....	.....	.....	.....	.....	.....
Pittsburgh *N1*	17.00	3.25	21.00	7.25	23.00	10.75	23.50	9.75	24.00	10.50	24.50	11.00	25.00	9.75	+0.50	+14.50	7.00	+8.75	9.50	+6.25	14.50	+1.25
Wheeling *W5*	17.00	3.25	21.00	7.25	23.00	10.75	23.50	9.75	24.00	10.50	24.50	11.00	25.00	9.75	.....	.....	.....	.....	.....	.....	.....	.....
Wheatland *W4*	17.00	3.25	21.00	7.25	23.00	10.75	23.50	9.75	24.00	10.50	24.50	11.00	25.00	9.75	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown *Y1*	17.00	3.25	21.00	7.25	23.00	10.75	23.50	9.75	24.00	10.50	24.50	11.00	25.00	9.75	+0.50	+14.50	7.00	+8.75	9.50	+6.25	14.50	+1.25
Indiana Harbor *Y1*	16.00	2.25	20.00	6.25	22.00	9.75	22.50	8.50	23.00	9.50	23.50	10.00	22.00	8.75	.....	.....	.....	.....	.....	.....	.....	.....
Lorain *N2*	17.00	3.25	21.00	7.25	23.00	10.75	23.50	9.75	24.00	10.50	24.50	11.00	25.00	9.75	+0.50	+14.50	7.00	+8.75	9.50	+6.25	14.50	+1.25

Threads only, buttweld and seamless 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.

Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2½" and 3" pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 13.50¢ per lb.

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	$1.68	T-1
18	4	1	—	5	2.385	T-4
18	4	2	—	—	1.845	T-2
1.5	4	1.5	8	—	1.04	M-1
6	4	2	6	—	1.43	M-3
6	4	2	5	—	1.185	M-2

High-carbon chromium	.83 D-3, D-5
Oil hardened manganese	.45 O-2
Special carbon	.41 W-1
Extra carbon	.345 W-1
Regular carbon	.29 W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

CLAD STEEL

Base prices, cents per lb f.o.b.

	Cladding	Plate (*A3, J2, L4*) 10 pct	15 pct	20 pct	Sheet (*I2*) 20 pct
Stainless Type	304	34.60	38.90	41.50	
	316	39.70	43.20	46.65	
	321	36.35	39.80	43.50	
	347	39.50	43.95	48.45	
	405	29.20	33.15	37.05	
	410, 430	28.70	32.65	36.55	

CR Strip (S9) Copper, 10 pct, 2 sides, 41.40; 1 side, 33.60.

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Fully Processed
Field	9.00	9.20	.....
Armature	10.35	10.35	10.85
Elect.	11.00	11.025	11.525
Meter	12.05	12.075	12.575
Dynamo	13.05	13.05	13.55
Trans. 72	14.05	14.05	14.55
Trans. 65	14.60	Grain Oriented	
Trans. 58	15.10	Trans. 80	18.50
Trans. 52	16.15	Trans. 73	19.00

Producing points: Beech Bottom (*W5*); Brackenridge (*A3*); Granite City (*G2*); Indiana Harbor (*I3*); Mansfield (*E2*); Newport, Ky. (*N5*); Niles, O. (*N3*); Vandergrift (*U1*); Warren, O. (*R3*); Zanesville (*A1*).

LAKE SUPERIOR ORES

$1.50% Fe natural content, delivered lower Lake ports. Prices for 1956 season. Freight changes for seller's account.

	Gross Ton
Openhearth lump	$12.10
Old range, bessemer	11.35
Old range, nonbessemer	11.10
Mesabi, bessemer	11.00
Mesabi, nonbessemer	10.85
High phosphorus	10.85

HOUSES WARE-

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery ‡ Charge	Sheets: Hot-Rolled	Sheets: Cold-Rolled (15 gage)	Sheets: Galvanized (10 gage)	Strip: Hot-Rolled	Strip: Cold-Rolled	Plates	Shapes: Standard Structural	Bars: Hot-Rolled	Bars: Cold-Finished	Alloy Bars: Hot-Rolled 4615 As Rolled	Alloy Bars: Hot-Rolled 4140 Annealed	Alloy Bars: Cold-Drawn 4615 As Rolled	Alloy Bars: Cold-Drawn 4140 Annealed
Baltimore	$.10	7.79	9.54	9.12	8.27	.....	8.12	8.57	8.34	9.09	14.99	14.44	18.39	18.09
Birmingham	.15	7.68	8.88	8.85	7.78	.....	8.01	8.05	7.91	10.04	.....	.....	.....	.....
Boston	.10	8.70–8.80	9.73–9.83	10.82–11.02	8.79–8.89	.....	8.98–9.08	8.90–9.00	8.88–8.98	10.71–10.81	15.05	14.45	18.51	18.10
Buffalo	.15	7.90	9.05	10.87	8.15	.....	8.40	8.40	8.15	8.85	15.00	14.45	18.40	.....
Chicago	.15	7.70–7.85	8.88–9.05	9.85	7.78–7.93	.....	8.01–8.16	8.05–8.20	7.91–8.06	8.35–8.50	14.65	14.10	18.05	17.75
Cincinnati	.15	7.97	9.04	9.85	8.21	.....	8.49	8.70	8.34	8.97	14.93	14.38	18.33	18.03
Cleveland	.15	7.83	9.03	9.75	8.03	.....	8.36	8.53	8.14	8.75	14.73	14.18	18.13	17.83
Denver		9.55	11.09	12.41	9.70	.....	9.80	9.60	9.75	10.54	.....	.....	.....	19.79
Detroit	.15	8.06	9.28	10.17	8.25	.....	8.48	8.70	8.33	8.83	.....	14.04	.....	17.09
Houston		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Kansas City	.20	8.52	9.72	10.07	8.60	.....	8.83	8.87	8.73	9.42	15.32	14.77	18.72	18.42
Los Angeles	.10	9.00	10.75	11.75	9.20	.....	9.45	9.05	8.90	11.80	15.85	15.35	19.70	19.45
Memphis	.15	8.02	9.22	.....	8.12	.....	8.35	8.39	8.25	9.85	.....	.....	.....	.....
Milwaukee	.15	7.97	9.17	9.97	8.05	.....	8.28	8.39	8.18	8.72	14.77	.....	18.17	17.87
New Orleans	.15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
New York	.10	8.45	9.63	10.33	8.91	.....	8.88	8.84	8.93	10.71	15.02	14.47	18.42	18.12
Norfolk	.20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Philadelphia	.10	7.89–7.99	9.08–9.18	9.66–10.22	8.58–8.68	.....	8.28–8.38	8.38–8.48	8.37–8.47	9.12–9.22	14.80	14.15–14.25	18.20	17.90
Pittsburgh	.15	7.83	9.03	10.20	8.03**	.....	8.16	8.20	8.06	8.75	14.65	13.80–14.10	18.05	16.85–17.75
Portland		9.90	11.00†	11.40	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Salt Lake City	.20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
San Francisco	.10	8.85	10.40	10.90	9.05	.....	8.95	8.95	8.90	12.40	15.85	15.35	19.70	19.45
Seattle	.00	9.35	11.20	11.55	9.50	.....	9.05	9.15	9.30	13.15	16.10	15.55	19.50	19.20
St. Louis	.15	8.02–8.17	9.16–9.36‡	10.03–10.18	8.11–8.26	.....	8.34–8.49	8.48–8.63	8.25–8.40	8.93–9.08	14.83–14.98	14.28	18.23–18.38	17.93
St. Paul	.25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets for quantity.

** F.O.B. Plant, warehouse price. † 16 gage. ‡ Deduct for country delivery.

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails Col	Woven Wire Fence 9–15½ ga. Col	"T" Fence Posts Col	Single Loop Bale Ties Col	Galv. Barbed and Twisted Barbless Wire Col	Merch. Wire Annl'd ¢/lb.	Merch. Wire Galv. ¢/lb.
Alabama City *R3*	167	181	...	195	187	8.10	8.50
Aliquippa, Pa. *J3*	167	184	...	...	184	8.10	8.65
Atlanta *A8*	169	187	...	197	193	8.20	8.80
Bartonville *K2**	169	187	...	197	193	8.20	8.80
Buffalo *W6*	...	...	...	...	...	8.10	8.50
Chicago, Ill. *N4***	167	185	...	195	191	8.10	8.70
Cleveland *A6*	173	...	...	...	...	8.10	.....
Cleveland *A5*	...	...	...	...	...	8.10	.....
Crawfordsville *M4**	169	187	...	197	193	8.20	8.80
Donora, Pa. *A5*	167	181	...	195	187	8.10	8.50
Duluth *A5*	167	181	...	195	187	8.10	8.50
Fairfield, Ala. *T2*	167	181	...	175	187	8.10	.....
Galveston *D4*	169‡	...	...	...	...	...	.....
Houston *S2*	172	186	...	192	192	8.35	8.75
Johnstown, Pa. *B3**	167	185	167	167	191	8.10	8.70
Joliet, Ill. *A5*	167	181	...	195	189	8.10	.....
Kokomo, Ind. *C9*	169	183	...	197	189	8.20	8.60
Los Angeles *B2**	...	...	...	...	...	9.05	9.65
Kansas City *S2*	172	186	...	200	192	8.35	8.75
Minnequa *C6*	172	186*	172	200	192*	8.35	8.75
Monessen *P6*	167	185	...	...	191	8.10	8.10
Moline, Ill. *R3*	...	162	162	...	...	...	.....
Pittsburg, Cal. *C7*	186	204	...	...	207	9.05	9.45
Portsmouth *P7*	...	...	...	...	...	8.10	.....
Rankin, Pa. *A5*	167	181	...	...	187	8.10	8.50
So. Chicago *R3*	167	181	...	195	187	8.10	8.50
S. San Francisco *C6*	...	...	...	219	...	9.05	9.45
Sparrows Pt. *B3**	154	...	...	197	193	8.20	8.80
Struthers, O. *Y1*	...	...	...	...	...	8.10	8.60
Worcester *A5*	173	...	...	...	...	8.40	8.80
Williamsport, Pa. *S5*	...	...	175	...	...	...	.....

Galvanized products computed with zinc at 5¢ per lb. Exceptions: * zinc at 12.5¢ per lb; ** 13¢ zinc.

‡ —Wholesalers only.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26–0.40	0.41–0.60	0.61–0.80	0.81–1.05	1.06–1.35
Bristol, Conn. *W12*	.....	.....	.....	.....	.....
Buffalo, N. Y. *R7*	7.95	9.80	12.60	15.00	17.95
Carnegie, Pa. *S9*	‡	9.80	12.60	15.00	.....
Cleveland *A5*	7.95	9.80	12.60	15.00	17.95
Detroit *D1*	8.05	9.90	12.70	15.10	.....
Detroit *D2*	.....	.....	.....	.....	.....
Harrison, N. J. *C11*	.....	.....	12.90	15.30	18.25
Indianapolis *C5*	8.10	9.95	12.60	15.00	17.95
New Castle, Pa. *B4*	7.95	9.80	12.60	15.00	.....
New Haven, Conn. *D1*	8.40	10.10	12.90	15.30	.....
Pawtucket, R. I. *N7*	.....	.....	.....	.....	.....
Pittsburgh *S7*	7.95	9.80	12.60	15.00	17.95
Riverdale, Ill. *A1*	8.05	9.80	12.60	15.00	17.95
Sharon, Pa. *S1*	8.05	9.90	12.70	.....	.....
Trenton *R4*	.....	10.10	12.90	15.30	18.25
Wallingford *W1*	.....	.....	.....	.....	.....
Warren, Ohio *T4*	7.95	9.80	12.60	15.00	17.95
Weirton, W. Va. *W3*	7.95	9.80	12.60	15.00	17.95
Worcester, Mass. *A5*	8.50	10.10	12.90	15.30	18.25
Youngstown *C5*	7.95	9.80	12.60	15.00	17.95

‡ On Application.

BOILER TUBES

$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	Size B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
Babcock & Wilcox	2	13	34.88	40.85	33.21	.....
	2½	12	46.98	55.01	44.73	.....
	3	12	54.24	63.53	51.66	.....
	3½	11	63.32	74.16	60.30	.....
	4	10	84.09	98.47	80.07	.....
National Tube	2	13	34.88	40.85	33.21	.....
	2½	12	46.98	55.01	44.73	.....
	3	12	54.24	63.53	51.66	.....
	3½	11	63.32	74.16	60.30	.....
	4	10	84.09	98.47	80.07	.....
Pittsburgh Steel	2	13	34.88	40.85	.....	.....
	2½	12	46.98	55.01	.....	.....
	3	12	54.24	63.53	.....	.....
	3½	11	63.32	74.16	.....	.....
	4	10	84.09	98.47	.....	.....

(Effective Aug. 28, 1956)

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Untreated
Bessemer *U1*	5.075	6.00	6.35				
So. Chicago *R3*				8.775			
Ensley *T2*	5.075	6.00					
Fairfield *T2*		6.00		8.775		6.025	
Gary *U1*	5.075	6.00				6.025	
Ind. Harbor *I3*	5.075		6.35	8.775		6.025	
Ind. Harbor *Y1*				8.775			
Johnstown *B3*		6.00					
Joliet *U1*	5.075		6.35				
Kansas City *S2*				8.775			
Lackawanna *B3*	5.075	6.00	6.35			6.025	
Lebanon *B3*							13.10
Minnequa *C6*	5.075	6.50	6.35	8.775		6.025	13.10
Pittsburgh *P5*				8.775	12.85		
Pittsburgh *J3*				8.775			13.10
Seattle *B2*				9.275		6.35	16.60
Steelton *B3*	5.075		6.35			6.175	13.60
Struthers *Y1*				8.775			
Torrence *C7*							
Williamsport *S5*		6.15					
Youngstown *R3*				8.775			

COKE

	Net-Ton
Furnace, beehive (f.o.b. oven) Connellsville, Pa.	$14.50 to $14.75
Foundry, beehive (f.o.b. oven)	$17.00 to $18.00
Foundry, oven coke	
Buffalo, del'd	$30.75
Detroit, f.o.b.	29.50
New England, del'd	30.55
Seaboard, N. J., f.o.b.	26.7b
Philadelphia, f.o.b.	26.50
Swedesland, Pa., f.o.b.	26.50
Painesville, Ohio, f.o.b.	27.50
Erie, Pa., f.o.b.	27.50
Cleveland, del'd	29.43
Cincinnati, del'd	28.59
St. Paul, f.o.b.	28.50
St. Louis, f.o.b.	30.50
Birmingham, f.o.b.	27.60
Milwaukee, f.o.b.	29.50

ELECTRODES

Cents per lb f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE Diam. (In.)	Length (In.)	Price	CARBON* Diam. (In.)	Length (In.)	Price
24	84	23.00	40	100, 110	9.90
20	72	22.25	35	110	9.90
16 to 18	72	22.50	30	110	10.05
14	72	23.00	24	72 to 84	10.30
12	72	23.50	20	90	10.10
10	60	24.75	17	72	10.35
7	60	24.50	14	72	10.85
5	60	27.25	12	60	11.75
4	40	30.25	10	60	11.80
3	40	32.00	8	60	12.10
2½	30	33.75			
2	24	52.50			

* Prices shown cover carbon nipples.

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, frt allowed in quantity)

Copper	
Cast elliptical, 18 in. or longer, 5000 lb lots	62.92
Electrodeposited	50.28
Brass, 80-20, ball anodes, 2000 lb or more	60.00
Zinc, ball anodes, 2000 lb lots	21.25
(for elliptical add 2¢ per lb)	
Nickel, 99 pct plus, rolled carbon	90.50
(rolled depolarized add 3¢ per lb)	
Cadmium	$1.70
Tin, ball anodes and elliptical	$1.06 to $1.10

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	80.50
Copper sulphate, 5 or more 100 lb bags, per cwt.	27.15
Nickel salts, single, 4-100 lb bags	38.25
Nickel chloride, freight allowed, 300 lb	46.50
Sodium cyanide, domestic, f.o.b. N. Y., 200 lb drums	22.35
(Philadelphia price 22.60)	
Zinc cyanide, 100 to 900 lb	55.55
Potassium cyanide, 100 lb drum N. Y.	48.00
Chromic acid, flake type, 1 to 20 100 lb drums	29.25

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Machine and Carriage Bolts

	Discounts Full container Quantity
½ in. & smaller x 6 in. & shorter	55
1⅛ in. and larger x all lengths	44
Rolled thread carriage bolts ½ in. & smaller x 6 in. and shorter	55
Lag, all diam. x 6 in. & shorter	55
Lag, all diam. longer than 6 in.	47
Plow bolts, ½ in. and smaller x 6 in. and shorter	54

Nuts, Hex, HP reg. & hvy.

¾ in. or smaller	63
⅞ in. to 1 in. inclusive	59½
1⅛ in. to 1½ in. inclusive	64
1⅝ in. and larger	58

C.P. Hex regular & hvy.

¾ in. and smaller	63
⅞ in. to 1½ in. inclusive	59½
1⅝ in. and larger	58

Reg. and Hvy. Semi-finished Hex Nuts

¾ in. and smaller	63
⅞ in. to 1½ in. inclusive	59½
1⅝ in. and larger	58

(Add 25 pct for less than case or keg quantity)

Rivets

	Base per 100 lb
½ in. and larger	$10.85
	Pct Off List
7/16 in. and smaller	26½

Cap Screws

	Discount (Packages) Bright Treated	H. C. Heat
New std. hex head, packaged		
⅝" diam. and smaller x 6" and shorter	47	34
¾", ⅞" and 1" diam. x 6" and shorter	31	13
⅝" diam. and smaller x longer than 6"	18½	+1
¾", ⅞" and 1" diam. & longer than 6"	5½	+19½

Machine Screws & Stove Bolts

		Discount Mach. Screws	Stove Bolts
Packaged, package list		27	38
Bulk, bulk list			
	Quantity		
¼-in. diam. & under	25,000-200,000	20	61
5/16-in. diam. & larger	15,000-100,000	20	61
All diam. over 3 in. long	5,000-100,000	—	61

Machine Screw & Stove Bolt Nuts

		Discount Hex	Square
Packaged, package list		24	27
Bulk, bulk list			
	Quantity		
¾-in. diam. & smaller	25,000-200,000	18	20

(Ferroalloy prices published in the Aug. 23 issue, will next appear in the Sept. 6 issue.)

CAST IRON WATER PIPE INDEX

Birmingham	119.0
New York	131.4
Chicago	133.4
San Francisco-L. A.	140.2

Dec. 1955 value, Class B or heavier 6 in. or larger, bell and spigot pipe. Explanation: p. 87, Sept. 1 issue. Source: U. S. Pipe and Foundry Co.

REFRACTORIES

Fire Clay Brick	*Carloads per* 1000
First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5.00)	$128.00
No. 1 Ohio	128.00
Sec. quality, Pa., Md., Ky., Mo., Ill., No. 2 Ohio	98.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $2.00)	20.00

Silica Brick	
Mt. Union, Pa., Ensley, Ala.	$140.00
Childs, Hays, Pa.	145.00
Chicago District	150.00
Western Utah	144.00-165.00
California	170.00
Super Duty Hays, Pa., Athens, Tex., Windham, Warren, O., Morrisville	150.00-157.00
Silica cement, net ton, bulk, Latrobe	26.50
Silica cement, net ton, bulk, Chicago	24.00
Silica cement, net tons, bulk, Ensley, Ala.	25.50
Silica cement, net ton, bulk, Mt. Union	23.00
Silica cement, net ton, bulk, Utah and Calif.	35.00

Chrome Brick	*Per net ton*
Standard chemically bonded, Balt.	$98.00
Standards chemically bonded, Curtiner, Calif.	108.00
Burned, Balt.	92.00

Magnesite Brick	
Standard Baltimore	$121.00
Chemically bonded, Baltimore	109.00

Grain Magnesite	St. % to ½-in. grains
Domestic, f.o.b. Baltimore in bulk.	$69.40
Domestic, f.o.b. Chewalah, Wash., Luning, Nev.	
in bulk	43.00
in sacks	49.00

Dead Burned Dolomite	*Per net ton*
F.o.b. bulk, producing points in:	
Pa., W. Va., Ohio	$16.00
Midwest	15.60
Missouri Valley	15.00

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh

Swedish sponge iron f.o.b. Riverton, N. J., ocean bags	8.50¢
Canadian sponge iron, Del'd in East, carloads	9.5¢
Domestic sponge iron, 98+% Fe, carload lots	8.5¢
Electrolytic iron, annealed, imported 99.5+% Fe	27.5¢
domestic 99.5+% Fe	36.5¢
Electrolytic iron, unannealed minus 325 mesh, 99+% Fe	57.0¢
Electrolytic iron melting stock, 99.84% pure	22.0¢
Carbonyl iron size 5 to 10 micron, 98%, 00.8+% Fe	86.0¢ to $1.55
Aluminum freight allowed	38.00¢
Brass, 10 ton lots	37.50¢ to 50.00¢
Copper, electrolytic	59.50¢
Copper, reduced	59.50¢
Cadmium, 100-199 lb, 95¢ plus metal value	
Chromium, electrolytic 99.85% min. Fe .03 max. Del'd	$5.00
Lead	8.90¢ plus metal value
Manganese	70.0¢
Molybdenum, 99%	$3.00 to $3.25
Nickel, unannealed	$1.00
Nickel, annealed	$1.06
Nickel, spherical, unannealed #80	$1.13
Silicon	43.50¢
Solder powder	7.0¢ to 9.0¢ plus met. value
Stainless steel, 302	99.0¢
Stainless steel, 316	$1.32
Tin	14.00¢ plus metal value
Tungsten, 99% (65 mesh)	$4.50
Zinc, 10 ton lots	18.75¢ to 32.50¢

JALTEN
gives
EQUAL STRENGTH
with
LIGHTER WEIGHT
Truck bodies are naturals for wear and tear—and Jalten sheets. Light and strong and corrosion-resistant, Jalten is fine for forming.

Low alloy, high strength Jalten offers good formability coupled with excellent corrosion and abrasion resistance

Jalten's high strength permits high design loads. It also permits a reduction in section when used to replace mild steels. Usually the reduction amounts to two gages affording a weight savings of approximately 25 per cent. Thus, dead weight can be eliminated—resulting in increased carrying capacity. Also, it is easily welded.

Jalten is furnished in four grades:

No. 1—possesses high strength, good formability and fabricating qualities—good resistance to low temperature impact.

No. 2—offers high strength, moderate formability—improved resistance to atmospheric corrosion.

No. 3—gives high strength—improved resistance to abrasion.

No. 4—provides superior formability and surface quality for bumper stock applications requiring plating.

Jalten Steels are available as sheets, strip, plates, structurals, bars and small shape sections.

SEND FOR THIS NEW BOOK:
Chemical properties of Jalten
Mechanical properties of Jalten
Jalten equivalents
Jalten application data

Jones & Laughlin
STEEL CORPORATION · PITTSBURGH

J&L STEEL

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30—ALL-STEEL ORE CARS, HOPPER TYPE
40 and 50-ton capacity
Excellent condition. Immediate delivery!

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Cleaned and Tested

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Chicago 33, Illinois
Phone: Mitchell 6-1212

New York Office
50-B Church Street
New York 7, N. Y.
Phone: BEekman 3-8230

"ANYTHING containing IRON or STEEL"

THE CLEARING HOUSE

News of Used and Rebuilt Machinery

Inquiries Are Up . . . Detroit machinery dealers report that business in the area is beginning to pick up but they are not really enthusiastic as yet. The number of inquiries about machines has started to increase and dealers take this as a sign that actual sales will soon start to do the same.

Prices are holding firm and stocks are considered adequate for any sudden rush that may develop during the last quarter of the year.

Time of Change . . . The actual supply of machinery in the area is expected to increase very soon. First, the old Packard plant on Detroit's east side is in the process of being dismantled and the word is already out that any surplus machinery in the plant is going to be for sale. Some dealers are wondering about the quality of the machines but they expect that the equipment will be in good shape.

In addition, with model changeovers just around the corner, other automobile companies in the area are preparing lists of old machines that will no longer be needed to produce the new model cars.

So as far as the actual supply of machines is concerned, dealers are not worried and they believe that the number of inquiries presently coming in will take care of any surplus that might exist in the Detroit market.

Across the Border . . . At the same time, some dealers are steadily shipping equipment out of the country to Canada. Although the Canadian market has never been considered extensive as far as Detroit is concerned, indications are that it is broadening. Most of the machines currently being shipped are small production pieces for the manufacture of such things as children's playgrounds, swings, etc.

West Coast Calls . . . The number of inquiries from outside the state is also on the increase. This is particularly true of California. One dealer reports several calls in one week and reasons that the shortage of good equipment in that area is causing the demand.

Auction sales are still going strong here and so are the prices. Dealers continue to complain that bidding at the sales is extremely unrealistic and puts them at a competitive disadvantage. They are particularly upset because auction sales are on an "as-is" basis.

Best Bets . . . Hottest sellers in the area right now are lathes and presses. The demand for these two items is particularly strong and is expected to get better as manufacturers go into the fall season.

Business in the fourth quarter is expected to be much better than it was during the summer months.

The feeling is that activity will stay at a high level for the rest of the year and that when the books are added up, they will show that this year has been better in every respect than 1955. This is true despite the fact that there has been a definite slowdown during the last three months.

The Look Ahead . . . While the slowdown in automotive production hasn't helped anyone, dealers expect that business will start to improve around the end of the current month. The coming upswing will probably become more pronounced in September and certainly should hit its stride in October when all the auto manufacturers will be in full production on the new model cars.

CONSIDER GOOD USED EQUIPMENT FIRST

BENDING ROLLS
6' x 3/16" Niagara, Initial Type
6' x ⅜" Webb Bal., Initial Type
10' x 10 Ga. Bertsch, Initial Type
12' x ⅜" Cleveland Pyramid Type
16' x ⅜" Niles Pyramid Type

BRAKES—LEAF TYPE
10' x 16 Ga. Dreis & Krump Hand Operated
12' x ⅜" Dreis & Krump
12' x ½" Dreis & Krump, Motor Driven

BRAKES—PRESS TYPE
8' x ⅛" Cincinnati
10' x ¼" Superior Hydraulic, NEW
12' x ⅜" Superior Hydraulic, NEW

CRANES—OVERHEAD ELECTRIC TRAVELING

5 ton P&H	29' Span 230 Volt D.C.
5 ton Shepard Niles	45' Span 220/440 A.C.
5 ton Shepard Niles	55' Span 220 Volt D. C.
5 ton Cleveland	98' Span 230 Volt D.C.
10 ton Cyclops	40' Span 220/440 A.C.
10 ton P&H	90' Span 220 Volt D.C.
15 ton P&H	44' Span 230 Volt D.C.
20 ton Toledo	75' Span 550/3/60 A.C.
25 ton L-B Incl. 300 ft. Runway	75' Span 220/3/60 A.C.
80 ton Niles 2—40 ton Trolleys & 5-ton Auxiliary	72' Span 230 Volt D.C.
120 ton Niles 2—60-ton Trolleys & 10-ton Auxiliary	68' Span 440/3/60 A.C.

FORGING MACHINES
2" Ajax, Air Clutch
1" to 5" Acme, Ajax, National

HAMMERS—BOARD DROP
800 & 2000# Chambersburg J-2
1000, 1200, 2500# Chambersburg
1600# Billings & Spencer

HAMMERS—STEAM DROP
1000, 1250, 3000# Chambersburg

HAMMERS—STEAM FORGING
800, 1100, 1500# Niles-Bement-Pond
1500, 2000, 4000, 8000# Chambersburg
1000, 1100, 1500, 6000, 12,000# Erie
10 Ton Massey—New 1942

LEVELLERS—ROLLER
60" United 17 Rolls 3⅜" Dia.
72" McKay 17 Rolls 4½" Dia.
72" McKay 17 Rolls 2½" Dia. Backed-up
84" McKay 17 Rolls 4¼" Dia.

NO. 3 MEDART THREE ROLL ROTARY STRAIGHTENER
Capacity 1" to 3½" Solid
STEEL BARS & 4½" PIPE OR TUBE

PRESSES—HYDRAULIC
500 ton Clearing H-1500-40, 24" Stroke, Bed 36x42"
600 ton Southwark 16" Stroke, Bed 60x74"
750 ton Elmes, 54" Stroke, Platen 30¼x38"
800 ton Clearing, 48" Stroke, Bed 48x48"
1000 ton Lake Erie Dble Acting, 46" Strokes, Bed Area & Platen 72" x 146"

PRESS—STRAIGHT SIDE
Clearing Model TF41500-200 Triple Acting Strokes 40, 32, 14", Bed Area 100" x 200"

PUNCH & SHEAR COMBINATIONS
Style EF Cleveland 36" Throat, Punch 1¼" thru 1" Style W Cleveland 60" Throat, 312 Ton
Fels LUSEFF, Punch 1⅝" x 1" Shear Angles 6 x 6 x ⅝" Bd. 2½", Sq. 2⅝", etc.

ROLLING MILLS
10" x 16" Single Stand, Two High
12" x 16" Phila. Single Stand, Two High
12" x 20" Standard Single Stand, Two High
15" x 28" Farrel Single Stand, Two High
15" x 30" G & M Single Stand, Two High
16" x 24" Farrel Two Stand, Two High
20" x 60" Two High Breakdown Mill
22" x 12" x 40" Lewis 3-High Shut Mill
44 x 28" x 44 x 144" Three High
26" x 54" United Single Stand, Two High

ROLL FORMING
8 Stand Maplewood Spindle 2" Dia., 12" Dist. between spindles

SHEARS—GATE
90" x 1¼" Williams & White
125" x 1" Hilles & Jones

SHEAR—ANGLE
6 x 6 x ⅝" Cleveland

SHEARS—SQUARING
8' x ½" Niagara LS
10' x ¼" Cincinnati, LATE
12' x 3/16" Niagara SL-12
12' x ⅜" Steelweld LATE
14' x ⅜" Dreis & Krump

SLITTERS
36" Yoder Slitting Line
G-48 Yoder Gang Slitter, 5" Threaded Arbor

STRAIGHTENERS
Kane & Roach 2 Roll Rotary Straightener, M.D. Capacity Mildsteel ¼" to ⅜"
Kane & Roach 5 Roll #5250-B, Capacity ⅝" to 2½" solid, 4½" Tube
Aetna Standard 12 Roll Straightener, Capacity 2"

SWAGING MACHINE
#6½A Fenn, Capacity 2¼" Tube, 3⅝" Solid 10" Die Length, Hydraulic Feed, LATE

Manufacturing

A. T. HENRY & COMPANY, INC.

Equipment

50 CHURCH ST., NEW YORK CITY 8
Telephone COrtlandt 7-3437

Confidential Certified Appraisals
Liquidations — Bona Fide Auction Sales Arranged

Consulting Engineering Service
Surplus Mfg. Equipment Inventories Purchased

MOTOR GENERATOR SETS

Qu.	KW	Make	R.P.M.	D.C. Volts	A.C. Volts
1	2500	Whse.	720	600	4160/2300
1	2000	Al. Ch.	720	250	4160/2300
1	1200	Whse.	720	600	2300
1	1120	Elliott	720	250/250	2300
1	500	G.E.	1200	250	2300/440
1	500	Cr. Wh.	720	575/600	2300/440
1	300	G.E.	1200	250/275	2300
1	200	Elliott	1200	125	4000/2300
3	150	G.E.	1200	250	2300/440
1	120	Whse.	1200	250	2300/440
1	100	Al. Ch.	1200	250	4000/2300

LARGE MILL TYPE MOTORS

Qu.	HP	Make	R.P.M.	Volts	Type
1	3000	Whse.	600	525	Tandem
1	1500	Whse.	600	525	Rev.
1	700	Al. Ch.	135	230	Mill
2	600	Al. Ch.	300/600	600	Mill
2	600	Whse.	110/220	230	Mill
1	450	Whse.	450/600	230	SK
1	300	Whse.	300	250	Mill
4	275	Whse.	425/850	230	QM-660.6
1	150	Whse.	360/720	600	QM-666.3

SLIP RING MOTORS
Constant Duty 3 Phase 60 Cycle

Qu.	HP	R.P.M.	Make	Type	Volts
1	100	430	Al. Ch.		440/220
2	100	495	G.E.	1-15A-M	2300
1	100	900	El. Dy.		2300
1	100	1200	Whse.	CW	440/220
1	104	870	Whse.	CW	440/220
1	125	600	G.E.	1-14-M	2200
1	150	450	Whse.	CW-1000	440
1	150	490	Whse.	CW	440/220
1	150	585	Whse.	CW	4160/2200
1	150	720	Al. Ch.	ABY	440/220
1	200	435	G.E.	I-M	440
1	200	498	G.E.	I-14-M	2200
2	200	585	G.E.	I-12-M	2200
1	250	800	G.E.	MT-414	2200
1	250	720	Al. Ch.	ABY	440
1	350	360	Whse.	CW	2300
1	400	380	G.E.	MT-424	2300/440
1	400	585	Al. Ch.	ABY	2200
1	425	392	G.E.	I-M	440
1	450	440	Whse.	CW	2200
1	450	514	G.E.	I-M	2200
1	500	450	G.E.	I-M	2365
1	500	514	Al. Ch.	ANY	2200
1	700	295	Whse.	CW	2300
1	750	400	G.E.	I-M	2200
1	1000	445	Whse.	CW	2300
1	1250	595	Whse.	CW	6600
1	1500	360	G.E.	MT	2300
1	1800	270	Whse.	Mill type	6600
1	2500	257	G.E.	Mill type	6600

T. B. MAC CABE COMPANY

4302 Clarissa St., Philadelphia 40, Penna.
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Phone: Davenport 4-8300

RE-NU-BILT
GUARANTEED
ELECTRIC POWER EQUIPMENT

D. C. MOTORS

Qu.	H.P.	Make	Type	Volts	RPM
1	2200	G.E.	MCF	600	400/500
1	1200	G.E.	MCF	600	650/800
1	1000	G.E.	MCF	600	350/700
1	940	Whse.	QM	250	140/170
1	800	Whse.		250	450/550
1	500	Whse.	CC-216	600	300/900
3	450	Whse.		550	415
1	250	G.E.	MPC	230	400/600
1	200	Whse.	CB-5113	250	400/800
1	150	G.E.		600	250/750
1	150	Cr. Wh.	65H	230	1150
1	150	Whse.	SK-151B	230	900/1800
1	120	G.E.	MFC	230	250/1000
1	125	Whse.	SK-183	230	850
2	100	Whse.	SK-181	230	450/1000
1	100	G.E.	CD	230	400/1200
2	75	C.W.	53H-TEFC	230	860
1	50	G.E.	MD-412AE	230	550
1	50	Whse.	SK-131.5 B.B.D.P.	230	600/2200
4	30/40	Whse.	SK-131	230	500/1500

M-G Sets—3 ph. 60 Cy.

Qu.	K.W.	Make	RPM	D.C. Volts	A.C. Volts
1	3000(3U)	G.E.	514	600	4000/6900/ 13200
2	2000/2400	G.E.	450	250/300	2300/4600
1	1750/2100	G.E.	514	600	4000/6900/
1	2060	G.E.	500 25cy	660	11000
1	2000	G.E.	514	600	2300/4600
1	1500	G.E.	720	600	6600/13200
1	750	G.E.	720	125250	2300/4600
1	500	G.E.	900	540/540	4150
1	500	Whse.	900	125/250	440

TRANSFORMERS

Qu.	KVA	Make	Type	Ph.	Voltages
1	3000	A.C.	OISC	3	33000x2300
1	2500	A.C.	Furnace	3	13800x147/113.5
1	2500	A.C.	OISC	3	34520x13800
4	2000	Whse	OISC	3	6900x480
1	2000	Whse.	OISC	3	6900x2300/3985Y
3	1000	G.E.	HVDDJ	1	2400x480
3	1000	Wagner	OISC	1	13200x460
3	667	G.E.	HD	1	13800x2300
2	500	Kuhl	OISC	1	13200x6600
3	333	G.E.	HS	1	7200x2400/4160Y
3	333	G.E.	HD	1	13200x2300
3	333	G.E.	HSWR	1	2300/4000x230/460
1	300	G.E.	HT	3	4160x480/277
3	200	Whse.	OISC	1	13200x120/240

BELYEA COMPANY, INC.

47 Howell Street, Jersey City 6, N. J.

SELECT MACHINE TOOLS

GRINDING MACHINES
72" Hanchett 3-spd. rotary surface, new 1948.
13" x 60" Model 300 Hanchett vert. spdl., late.
14" x 36" Pratt & Whitney hyd. vert. surface, 1942.
No. 72A5 Heald hyd. pi. internal, extended bridge, 1943.
No. 74 Heald hyd. pi. internal, X-sliding H. B., 1941.
18" x 36" Landis type C hyd. pi. cylindrical, 1942.
6" x 30" Cincinnati EA Filmatic pi. cylindrical, 1942.

HAMMERS
No. 3 C Chambersburg pneumatic, serial No. 2297.
No. 6-I Nazel, pneumatic, late.
No. 66 Nazel, self-contained.

LATHES
No. 3 Gisholt Univ. Turret Lathes (2), 1942.
14" x 6' Hendey Toolroom, 1940.
15" 30" Lipe Carbo-Matic, 1942.
36" x 42" Bullard New Era vertical turret lathes.
126" x 96' CC Niles Bement Pond engine lathe, 80 HP, M.D.

PLANERS
36" Rockford Hyd. Openside Shaper-Planer.
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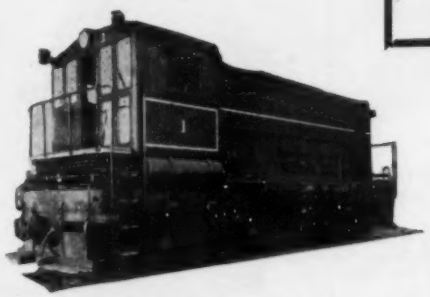

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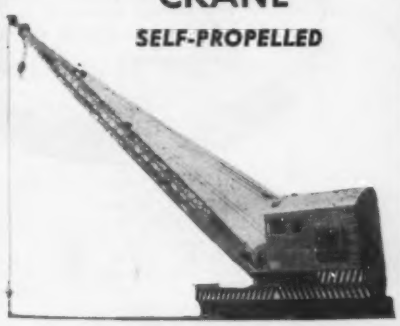

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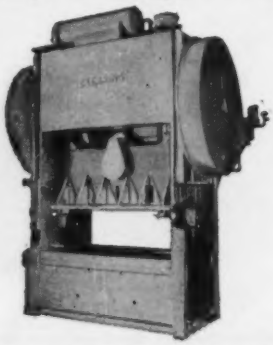

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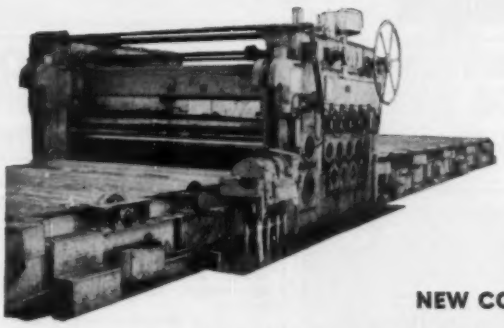

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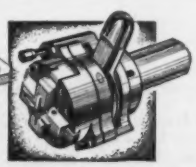

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METALWORKING BRIEFS

FTC Charges Fruehauf

Charges that Fruehauf Trailer Co., Detroit, violated anti-merger rules by buying up some of its competition were made by the Federal Trade Commission. The FTC will attempt to prove that the big truck-trailer maker is illegally increasing its "dominant" role and that it offers a special system of financing which other trailermakers cannot match.

Bethlehem Gets Ship Contract

Bethlehem-Sparrows Point Shipyard has been awarded a contract by the Navy's Bureau of Ships to construct three ammunition ships at a total price of $40,477,000. All three ships will have an overall length of 512 ft, with elevators in the stowage holds.

Molybdenum Prices Increased

Prices of molybdenite concentrate and molybdenum products have been increased an average of 7 pct, according to Climax Molybdenum Co. New prices per lb of contained molybdenum include $1.18 for concentrate; $1.39 for canned oxide; $1.68 for ferro-molybdenum other than powder.

Koppers, Kennecott Make Atomic Proposal

Koppers Co. and Kennecott Copper Corp. will submit a joint proposal to the Atomic Energy Commission to produce uranium feed materials for the AEC. Proposal calls for design, construction and operation of a plant with an annual capacity of up to 5000 tons of uranium salts. Each will furnish 50 pct of the equity capital.

Reynolds Goes Latin American

Reynolds Metals Co. will begin operations of an aluminum rolling mill and fabricating plant in Barranquilla, Colombia. The new company, Alumino De Colombia-Reynolds, will operate the plant. It was formed between Reynolds International and Colombian interests.

Appliance Prices on the Way Up

Prices of television sets and other home appliances are going up. Philco Corp. announced increases of $10 to $20 in retail prices of 15 TV receivers. Admiral Corp. increased prices of most refrigerators, freezers and electric ranges. Whirlpool-Seeger said prices of 1957 appliances would be 4.8 to 8.8 pct higher than last year.

Strike Closes Detroit Steel

A wildcat strike of 600 brick mason helpers idled the Portsmouth, O., plant of Detroit Steel. Production loss is some 3500 tons daily. Some 4200 employees were idled by the walkout.

ADVERTISERS

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for machine deburring and chamfering of line-drilled and otherwise inaccessible hole surfaces.

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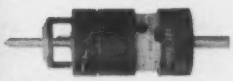

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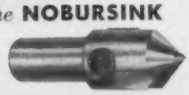

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Tool Steel Topics

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Airplane Builder's Change to Bearcat Increases Life of Rivet Sets 5 Times

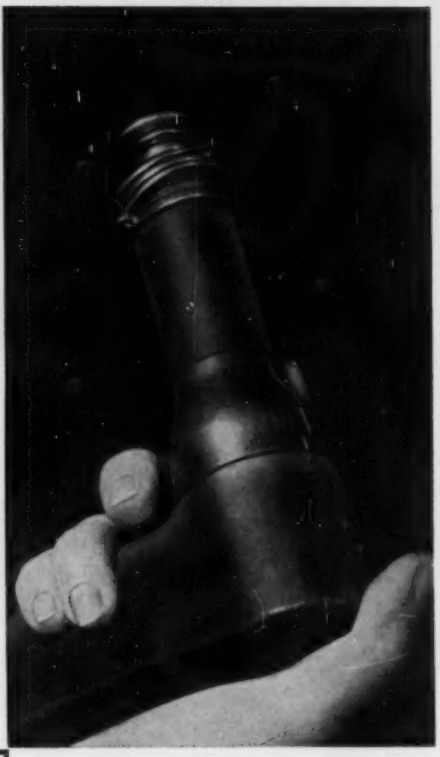
At the Wichita, Kans., plant of Boeing Airplane Company, rivet sets used on the B-47 and B-52, as well as other types of aircraft, had been providing satisfactory results. But, Boeing engineers reasoned, by checking the performance of other grades of tool steel in the same application, they might discover a tool steel that could do a better, more economical job.

So they ordered Bearcat, from Ford Steel Company, their Bethlehem tool-steel distributor in St. Louis. The results were impressive. The Bearcat sets gave five times longer service life then the sets previously used. In addition, the heads also drove down better, thus minimizing time lost in reworking, and facilitating ready acceptance by Boeing inspectors. Besides, with Bearcat's superior finish, there was less surface pick-up.

Bearcat is our super-tough, air-hardening general-purpose grade. It has exceptional resistance both to shock and to wear. Its air-hardening characteristic minimizes quenching hazards, and provides excellent resistance to distortion in heat-treatment.

In addition to rivet-set applications, Bearcat can be used advantageously for punches, chisels, hot headers, gripper dies and master hobs, as well as for dies used in blanking and bending, and cold-forming.

If you'd like to know more about Bearcat, or perhaps try it out in your shop, just get in touch with the nearest Bethlehem tool-steel distributor.



BETHLEHEM TOOL STEEL ENGINEER ASKS:

How Hard Should Tools Be?

It is sometimes difficult to determine the best hardness for certain tools. As all tools are subjected to wear it is ordinarily desirable to use the highest possible hardness. With most tools, this causes brittleness or breakage, making some compromise necessary. Generally speaking, tool hardness should be lowered from the maximum to a degree which causes the tools to consistently wear out in service, rather than fracture. The optimum hardness for a given type of tool often varies considerably, depending upon the operating conditions. However, here are the average hardnesses of commonly used tools:

TOOL	HARDNESS ROCKWELL C
High-speed steel, metal-cutting tools, single point	65
High-speed steel, metal-cutting tools, multiple point	63
Blanking dies	60
Forming dies	60
Drawing dies, hardened all over	60
Drawing dies, bore-hardened only	66
Gages	60
Shock-resisting tools (punches, etc.)	58
Hot-work tools	40/50
Cold shear blades	60
Hot shear blades	48
Tools subjected to max tensile loads (cylinders, containers, etc.)	53
Tools subjected to max compressive loads (plungers, punches, etc.)	60/65

These hardness figures should be used as a guide only, because for individual jobs the required hardness may be slightly higher or lower, depending upon circumstances.

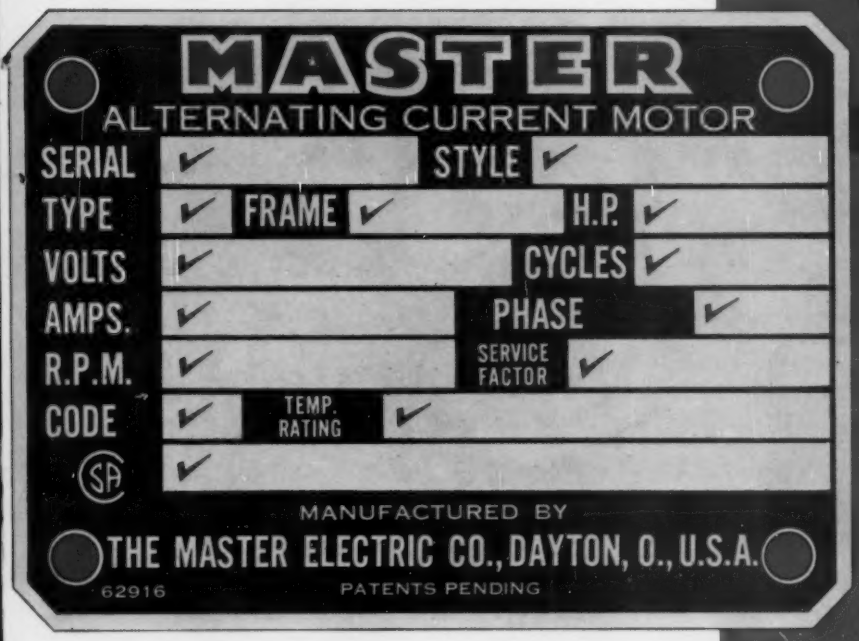
Tool Steel Color Film An Award Winner

"Teamwork," Bethlehem's 16-mm color film on tool steel, received an award for excellence in the sales promotion field at the recent Columbus Film Festival, held at Columbus, Ohio. The film, being received enthusiastically in all parts of the country, shows the manufacture of Bethlehem tool steels, and explains the reasons behind their quality control and heat-treatment. Typical applications of various grades are included.

The picture runs for 30 minutes. It is available for showings to machinists, diemakers, heat-treaters, machine-tool manufacturers and distributors. Its subject matter makes it excellent for technical society meetings, and for showings to engineering-student groups.

If you would like to see "Teamwork," drop a line to Publications Department, Room 1001, Bethlehem Steel Company, Bethlehem, Pa. If possible, please select a showing date well in advance, to permit adequate time for scheduling and shipping.

Write your own ticket—



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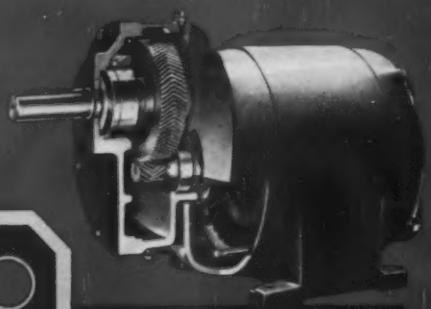
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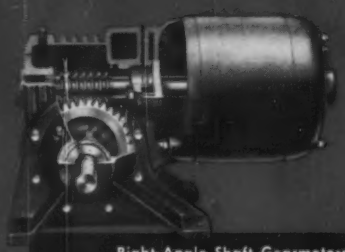
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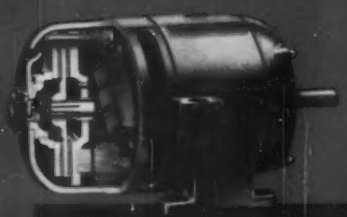
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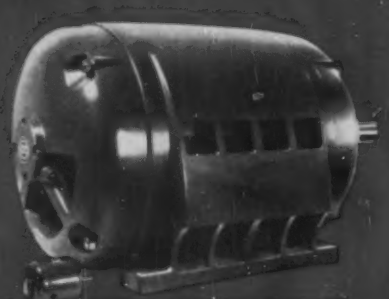
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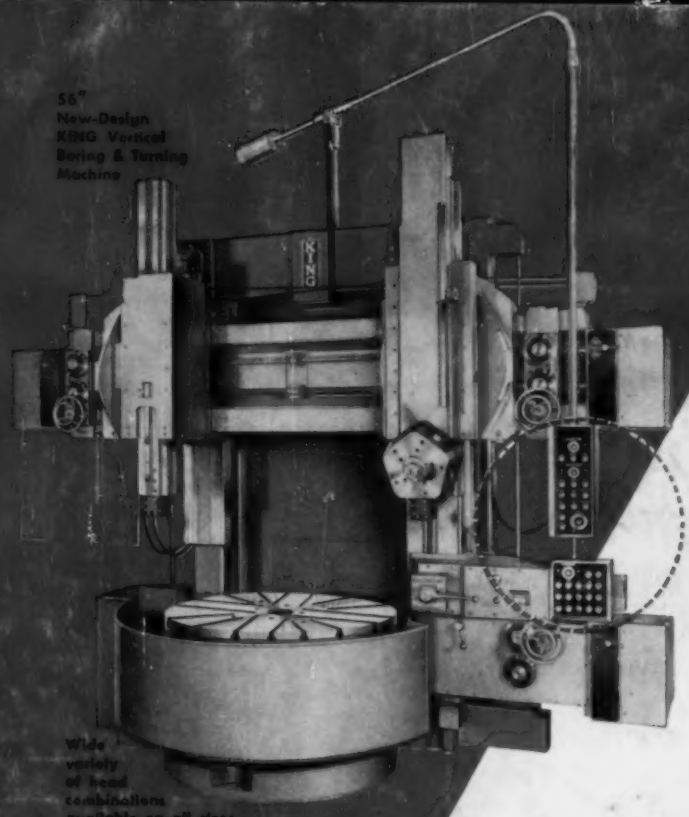

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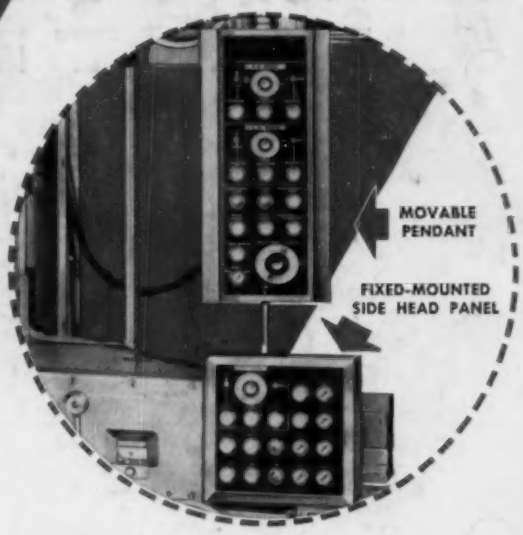

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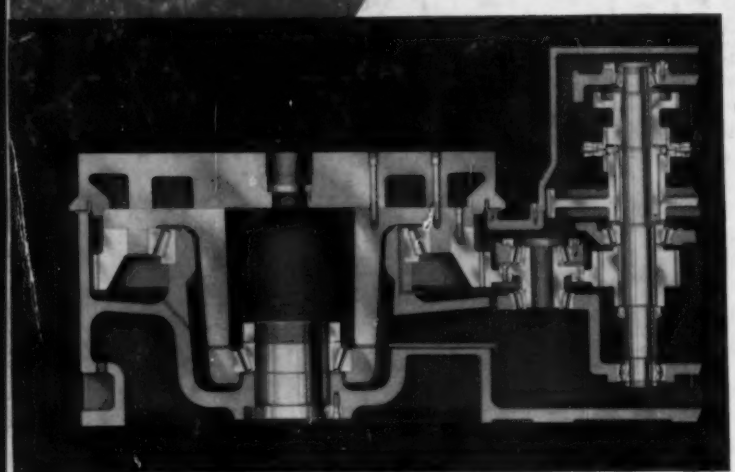

OUTSTANDING NEW SPINDLE MOUNTING

As shown in drawing, the spindle itself is extra heavy and rigid. Tapered roller, pre-loaded bearings are located so as to provide maximum spread, both radially and vertically, on the spindle. This construction greatly increases stability of the mounting. Note also that the drive is of helical-gear type, eliminating any tendency toward spindle deflection and loss of accuracy—a tendency always present with bevel gearing.

Full electrical operation has been engineered into these streamlined New-Design KING® Vertical Boring & Turning Machines. Control manipulation is cut to a bare minimum, speeding set-up time. Direction of all head movements is established by simplified "up-down" and "in-out" switches. Spindle speeds and feeds for all heads are pre-selective from direct-reading dials, conveniently located on the movable pendant and fixed side head panel, as are all other electrically operated controls.

Increased horsepower plus expanded speeds and feeds will remove metal at rates that take fullest advantage of the most modern cutting tools. Improved spindle operation, with resultant increased accuracy, is assured by many advanced construction features as illustrated in drawing at left. Integral drive construction permits removal of the entire drive as a unit, for easy maintenance.

These and other superior advantages in the new KING machines will greatly increase both accuracy and productivity on your boring, facing, and turning work. For full details see your King Distributor, or write us direct.

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